



US Army Corps
of Engineers®
Buffalo District

Lorain Harbor
Lorain County, Ohio

Draft Lorain Harbor Dredged Material Management Plan & Environmental Impact Statement



December 2008

**Dredged Material Management Plan and
Environmental Impact Statement
for
Lorain Harbor, Lorain County, Ohio**

Type of Action: Draft

Responsible Federal Agency:

U.S. Army Corps of Engineers
Buffalo District
1776 Niagara Street
Buffalo, NY 14207-3199

Cooperating Agencies:

Lorain Port Authority
City of Lorain
Federal, State, and local agencies
U.S. Environmental Protection Agency (USEPA)
U.S. Fish and Wildlife Service (USFWS)
Ohio Department of Natural Resources (ODNR)
Ohio Environmental Protection Agency (OEPA)

Abstract:

This draft Dredged Material Management Plan/Environmental Impact Statement (DMMP/EIS) presents the U.S. Army Corps of Engineers (USACE), Buffalo District plan for maintenance dredging and disposal of dredged materials from the Lorain Harbor, Ohio Federal Navigation Project. It integrates the Corps planning process and the CEQ guidelines for preparation of an environmental impact statement into one publication to reduce redundancy and to aid the reader. Inherent in the planning of this project is the Corps requirement that a DMMP provide for a minimum of 20 years of dredged material disposal.

This DMMP/EIS summarizes the results of a detailed multi-year investigation of various measures and alternative plans for dredged material disposal at Lorain, Ohio and evaluates the engineering, economic, and environmental benefits and consequences of those alternatives. This report also summarizes the public coordination done to date on the planning of this DMMP and accounts for the views of local interests (the non-Federal sponsor) who would be responsible for financially participating in the costs of construction of new disposal areas or the implementation of new disposal methods. Four alternatives were analyzed including one alternative which would constitute no action taken.

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Lorain Harbor
Dredged Material Management Plan and Draft Environmental Impact Statement
Lorain Harbor, Lorain County, Ohio

SUMMARY

Purpose of Document

This Dredged Material Management Plan/Environmental Impact Statement (DMMP/EIS) presents the U.S. Army Corps of Engineers (USACE), Buffalo District plan for maintenance dredging and disposal of dredged materials from the Lorain Harbor, Ohio Federal Navigation Project. Inherent in the planning of this project is the requirement that a dredged material management plan (DMMP) provide for a minimum 20 years of dredged material disposal. This DMMP/EIS summarizes the results of a detailed multi-year investigation of various measures and alternative plans for dredged material disposal at Lorain, Ohio and will evaluate the engineering, economic, and environmental effects of those alternatives. This report will also summarize the public coordination accomplished to date on the planning of this DMMP in accordance with the National Environmental Policy Act (NEPA). It also accounts for the views of local interests (the non-Federal sponsor) who would be responsible for financially participating in the costs of construction of new disposal areas or the use of new disposal methods.

In the interest of reducing redundancy and producing a coherent document, the required planning document (DMMP) and NEPA document (EIS) have been consolidated into one volume with appendices. This document meets Council of Environmental Quality (CEQ) guidance for preparation of an EIS and USACE requirement for preparation of a feasibility study, with added modifications which are required by USACE specifically for preparing DMMPs.

Description of Project Location and Harbor

Lorain Harbor is located on the south shore of Lake Erie at the mouth of the Black River in Lorain County, Ohio. The harbor is 28 miles west of Cleveland, Ohio and 72 miles east of Toledo, Ohio. Lorain Harbor is a major commercial port on Lake Erie. Waterborne traffic at Lorain Harbor consists primarily of the receipt and shipment of bulk commodities. In 2005, total tonnage was 3,055,000 tons. Receipts accounted for 94 percent and shipments accounted for 6 percent of all traffic. Iron ore has been the dominant commodity moving through Lorain Harbor and in 2005 accounted for 49 percent of all traffic at the harbor. Stone (limestone, gypsum, sand, and gravel) accounted for 41 percent and other bulk commodities for the remaining 10 percent of the harbor's waterborne bulk traffic.

The Outer Harbor is formed by a system of converging breakwaters in Lake Erie and covers an area of approximately 60 acres. The breakwaters have a total length of 8,500 feet. The Entrance Channel to the Black River is protected by two parallel piers, located

about 1,800 feet from the Outer Harbor entrance. The West pier is 1,004 feet long and the East pier is 880 feet long. Maintenance work on breakwaters has been performed by government equipment and personnel or by contract with private marine construction companies. Major rehabilitation of the Lorain Harbor breakwater system was completed in 2003. The expected project life of the repairs is 30 years; therefore, no additional repairs are expected during the DMMP study period of 2009-2028.

The Inner Harbor includes three miles of the Black River. The width of the channel varies from 200 to 500 feet. Three turning basins are located within the limits of the Federal Channel along the Black River.

The Confined Disposal Facility (CDF) at Lorain Harbor is located in the Outer Harbor and was completed in 1978 at 100 percent Federal cost of \$7,900,000. The facility is 58 acres and has a design capacity of 1,850,000 cubic yards. Since 1979, all dredged material has been placed in the Lorain Harbor CDF. Implementation of a Fill Management Plan (FMP) will enable USACE to operate the CDF for three additional biennial dredging cycles through 2012. A new disposal alternative, recommended by this DMMP, is expected to be operational in 2014 and provide for disposal of dredged material through 2028 and probably beyond.

Customers

The primary external customer, and presumed non-Federal cost-sharing partner, for this DMMP is the City of Lorain. Other customers include the Lorain Port Authority as well as Federal, State, and local agencies including the U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USF&WS), Ohio Department of Natural Resources (ODNR), and Ohio Environmental Protection Agency (OEPA).

The customer expectation is to have the USACE, Buffalo District continue to dredge Lorain Harbor and the Black River up to and including the Upper Turning Basin which will require disposal of dredged material in an environmentally acceptable manner. Dredging in Lorain Harbor is typically performed every other year and sometimes less due to USACE funding constraints.

Scoping

The City formed the Lorain Task Force in the 1970's shortly after the Lorain CDF was constructed. The purpose of the Task Force is to address eventual use of the CDF once it is filled and turned over to the City for management. The Lorain Task Force is comprised of most of the constituents and regulatory agencies which would be involved in preparation of a CDF Master Plan. This group forms the core of the range of stakeholders which the USACE has consulted throughout the DMMP study. The USACE held an initial meeting with local stakeholders on January 19, 2001 at the Lorain Port Authority Office in Lorain, Ohio to discuss the short and long term options for dredged material disposal and dredged material management from the existing Federal

navigation channels at Lorain. Since then, regular meetings and frequent coordination has taken place between the USACE and stakeholders.

A public meeting was held in Lorain, Ohio on May 22, 2003 for the purposes of both NEPA scoping and Plan Formulation. It was well attended and covered by the local newspaper. On April 11, 2005, in compliance with NEPA, a Public Scoping Information Packet was sent to numerous Federal, State, Tribal, and local agencies and presented the proposed alternatives for the DMMP. The Scoping Packet asked for input and recommendations on the proposed alternatives. Comments were received from 11 entities including Federal and State government, tribes, industry, and cultural resources. The Notice of Intent to prepare a draft EIS for the proposed DMMP was published in the *Federal Register* on March 6, 2007.

Alternatives and Major Conclusions

The analysis follows the USACE six-step planning process and started with identifying problems and opportunities, establishing study objectives (both national and local), and identifying planning constraints. Nine individual measures and 10 sub-measures were identified including beneficial use, best management practices, and construction of a new CDF. These measures were assessed and, if viable, were carried forward into four alternative plans for detailed analysis. The analysis included the potential social, economic, and environmental benefits and impacts that would result from each alternative plan. Each alternative is comprised of several measures. The environmental effects and total average annual cost is summarized in the table below.

Alternative	Measures	Environmental Effects	Total Average Annual Cost
Alternative 1	Open Lake Placement, new CDF, FMP	Direct, long-term positive effect on commercial navigation and removal of contaminated harbor sediments. CDF will create 37.5 acres of land for terrestrial resources and future development, but will result in permanent loss of 37.5 acres of aquatic habitat. Open-lake placement will result in smothering and mortality of benthic organisms at open-lake site.	\$3,199,700

Alternative	Measures	Environmental Effects	Total Average Annual Cost
Alternative 2	Brownfields Restoration, FMP	Indirect potential long-term effect due to creation of temporary, seasonal wetlands at RT-2. Direct, long-term positive effect by reusing brownfields site and increasing available area for development and regional growth. Potential long-term effects to aquatic resources by restoring stream bank habitat. Indirect, long-term cumulative effects on upland habitat with RT-2 restoration. Direct, short-term effect on local vehicular transportation if dredged material is trucked to RT-2.	\$1,358,900
Alternative 3	Brownfields Restoration, Open Lake Placement, FMP	Indirect potential long-term effect due to creation of temporary, seasonal wetlands at RT-2. Direct, long-term positive effect by reusing brownfields site and increasing available area for development and regional growth. Potential long-term effects to aquatic resources by restoring stream bank habitat. Indirect, long-term cumulative effects on upland habitat with RT-2 restoration. Direct, short-term effect on local vehicular transportation if dredged material is trucked to RT-2. Open-lake placement will result in smothering and mortality of benthic organisms at open-lake site.	\$1,261,800
Alternative 4	No Action	Direct, long-term negative effect on employment and income, community cohesion, community and regional growth, property values and tax revenues. Direct, long-term effect on commercial navigation and the creation of unsafe conditions for recreational vessels. Potential reduction in water depths for aquatic resources.	\$0

Alternative	Measures	Environmental Effects	Total Average Annual Cost
Base Plan	Brownfields Restoration, Open Lake Placement, FMP	Indirect potential long-term effect due to creation of wetlands at RT-2. Direct, long-term positive effect by reusing brownfields site and increasing available area for development and regional growth. Potential long-term effects to aquatic resources by restoring stream bank habitat. Indirect, long-term cumulative effects on upland habitat with RT-2 restoration. Direct, short-term effect on local vehicular transportation if dredged material is trucked to RT-2. Open-lake placement will result in smothering and mortality of benthic organisms at open-lake site.	\$1,261,800

Fill Management Plan: Since the FMP is considered Federal maintenance of the existing CDF and is performed at 100 percent Federal cost, the FMP was initiated concurrent with the preparation of this DMMP/EIS. Two raisings (2009 and 2011) will be constructed during the 20-year project evaluation period, which starts in 2009 and are discussed in this report. One berm raising has already been constructed in September 2007.

Base Plan: A base plan alternative was also established to provide a benchmark against which to measure the economics of each alternative. It was developed for the 20 year period 2009 through 2028. The plan assumes that 150,000 cy of channel bottom sediments will be dredged and placed every other year. The Base Plan has two components: from 2009 through 2013, a FMP to raise a series of perimeter berms will be used at the existing CDF to increase the capacity for dredged material placement; from 2014 through 2028, a new CDF or disposal alternative would be operational. The new facility would be of sufficient capacity to be used for at least 15 years, or eight dredging cycles. Alternative 3 is the same as the Base Plan.

National Economic Development (NED) Plan: Contributions to the NED are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the Nation. Contributions to NED include increases in the net value of those goods and services that are marketed, and also of those that may not be marketed. Alternative 3 is the same as the NED Plan.

Tentatively Selected Plan: The tentatively selected plan is Alternative Plan 3 (brownfields restoration, open-lake placement and fill management plan).

Areas of Controversy Including Issues Raised by Agencies and the Public

During scoping, the USACE received input that included concerns/issues regarding dredging and disposal management, environmental matters, and potential beneficial uses of dredged materials. Some issues identified include:

- Opposition to disposal of dredged material at Huron CDF,
- Support to continue Federal dredging at Lorain Harbor,
- Support to identify and assess beneficial uses,
- Support to assess watershed management to reduce sediment load,
- Support of vertical expansion and continued use of the existing CDF,
- Information on wildlife species and cultural resources was provided.

Another significant issue is that the State of Ohio, while it issued a water quality certification for open lake placement in 2006 for the first time in 30 years, has stated repeatedly that they want the USACE to explore beneficial use alternatives and alternatives to open-lake placement for dredged materials. Alternatives 2 and 3 include beneficial use measures; one includes open lake placement and one does not.

A serious issue that has been raised by the City of Lorain from the beginning of scoping is, due to its financial situation, the City would not have the resources to cost-share a project of any sizeable cost. This must be taken into consideration when evaluating Alternative 1 which includes construction of a new CDF at a projected cost of \$32 million.

Issues to be Resolved

The Buffalo District has been working closely with the City of Lorain to provide technical guidance in preparing an upland brownfield parcel, known as RT-2, a former coke plant site (a management measure in Alternatives 2 and 3) to be used for dredged material placement.

The City of Lorain will be required to provide the lands, easements, rights-of-way, relocation, and spoils disposal area (LERRD) necessary, and be required to have fee title and provide a 20 year Right of Entry for construction at the RT-2 site. A Memorandum of Agreement (MOA) will be negotiated with the City that addresses their agreement to provide the disposal location for the requisite number of years and hold the U.S. harmless. These agreements will ensure capacity for Federal dredged material management for a minimum 20-year period and the agreements will preclude the City of Lorain from charging USACE a tipping fee. Since the City is the permanent landowner of RT-2, they will be required to obtain applicable State and Federal permits, and modify the property as necessary to comply with those permits and other applicable regulations at 100 percent non-Federal cost. It is a win-win for all parties and a model for large scale beneficial use.

Project Status

A Feasibility Scoping Meeting (FSM) was conducted by teleconference on August 31, 2005. Participants included the Buffalo and Detroit Districts, Great Lakes & Ohio River Division (LRD), Headquarters, the Internal Technical Review (ITR) Team Leader, and the Lorain Port Authority (sponsor). The formal guidance Memorandum for Record was issued by LRD on October 12, 2005. It confirmed District assumptions, analyses, proposals, and documented issues to be resolved by the Buffalo District for incorporation in the draft DMMP/EIS. Prior to the FSM, the review packet underwent ITR by the Plan Formulation/Navigation Regional Technical Specialist in the Huntington District. The ITR Certification was signed on October 21, 2005.

The document underwent a second ITR prior to the Alternative Formulation Briefing (AFB) which was held by teleconference on April 7, 2008. The purpose of the AFB was to confirm plan formulation, the selection process, the tentatively selected plan, and that the Federal and non-Federal responsibilities are consistent with applicable laws, statutes, Executive Orders, regulations, and current policy guidance. The AFB participants included the Buffalo and Detroit Districts, LRD, Office of Water Project Review-Headquarters, the ITR Team, and the Lorain Port Authority (sponsor). The report has been revised to incorporate their comments and approved by LRD. The draft DMMP/EIS is hereby being released to agencies and the public for a minimum 45-day comment period in compliance with NEPA. Following the comment period, a final DMMP/EIS which responds to comments will be prepared, and a Record of Decision will be signed once all substantial comments are addressed.

Lorain Harbor Draft DMMP/EIS

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Included on CD

Appendix A – Base Plan
Appendix B – Preliminary Assessment
Appendix C – Scope of Work

Appendix D – NEPA Coordination
Appendix E – Risk Assessment
Appendix F – Sediment Sampling Results
Appendix G – Economic Evaluation
Appendix H – Risk Based Screening of Dredged Material
Appendix I – Cost Analysis
Appendix J – Fish and Wildlife Coordination Act Report
Appendix K – Real Estate Plan

1.0 – INTRODUCTION

1.1 Introduction – This Dredged Material Management Plan/Environmental Impact Statement (DMMP/EIS) presents the U.S. Army Corps of Engineers (USACE), Buffalo District plan for maintenance dredging and disposal of dredged material from Lorain Harbor, Ohio Federal navigation project. Inherent in the planning of this project is the requirement that a DMMP provide for a minimum 20 years of dredged material disposal. For the purpose of this study and to maintain current dredging operations at Lorain Harbor, the minimum 20 year period commences in 2009.

This DMMP/EIS will summarize the results of a detailed multi-year investigation of various options and alternative plans for dredged material disposal at Lorain Harbor, Ohio and will evaluate the engineering, economic, and environmental pluses and minuses of those alternatives. This report will also summarize the public coordination to date on the planning of this DMMP and account for the views of local interests (sponsors) who would be responsible for financially participating in the costs of construction of new disposal areas or the use of new disposal methods.

1.2 DREDGED MATERIAL MANAGEMENT PROBLEM STATEMENT

The basic problem or opportunity at Lorain Harbor, Ohio is the continued operation and economic viability of Lorain as a commercial navigation port on the Great Lakes. Based on 2005 data of total tonnage handled (3,055,000), Lorain Harbor is the 25th busiest port on the Great Lakes and 102nd busiest port in the nation (USACE-IWR, 2006). Inherent in the operations and maintenance of any Federal harbor is the maintenance of authorized channel depths and disposal of dredged material as well as dredging and dredged material disposal by other harbor interests. Complicating the need for dredging and dredged material disposal at Lorain Harbor is the fact that a portion of the sediments dredged are not suitable for open-lake placement and generally have to be confined in some environmentally acceptable manner.

Past and current practice for dredged material management at Lorain Harbor has been to contain this material in a confined disposal facility (CDF). In 1978, the USACE constructed a CDF for discharge of material periodically dredged from the harbor to maintain its adequate authorized project depths for deep-draft commercial navigation. The CDF is a semicircular structure that adjoins the East Breakwater Shorearm (Figure 1.1). The CDF is 58 acres and has an estimated design capacity of 1,850,000 cubic yards (cy). At the conclusion of the 2006 dredging season, the Lorain Harbor CDF was filled to design capacity. Under this DMMP study, USACE plans to provide a new CDF or alternative method of managing dredged material by 2014. Therefore, interim dredged material management options must be developed from 2008 through 2013, when a new facility or other option becomes available. It is expected that sufficient additional capacity can be obtained at the existing CDF using a fill management plan (FMP) internal to the CDF (e.g., dewatering, consolidation of dredged material, raising interior berms). The CDF will be transferred to the non-Federal sponsor for future waterfront use when it is no longer able to accept any more dredged material.



Figure 1.1 Lorain Harbor CDF

1.3 DREDGED MATERIAL MANAGEMENT PLANS

1.3.1 DMMP Study Authority and Process – The basic directions to conduct DMMP studies are contained in Engineering Regulation (ER) 1105-2-100, Appendix E, of the Planning Guidance Notebook. The studies are conducted to verify that all federally maintained navigation projects have sufficient capacity for dredged material disposal for a minimum of 20 years. The studies are conducted pursuant to existing authorities for individual navigation feasibility studies, pre-construction, engineering, and design (PED) investigations, construction, or operations and maintenance (O&M), as provided in congressional committee study resolutions and public laws authorizing specific projects. The DMMP process has the following four basic principles for existing navigation projects:

- Establish the Base Plan for the project.
- Assess the potential for beneficial use of dredged material.
- Establish a Management Plan for the project.
- Demonstrate the continued maintenance is economically warranted based on high-priority (non-recreational benefits).

1.3.2 Base Plan Defined - Critical to the entire process is defining and establishing the Base Plan. It is USACE policy to accomplish the management of dredged material associated with the maintenance dredging of navigation projects in the least costly, environmentally sound manner.

Dredged material management is to be consistent with sound engineering practice and meet all Federal environmental standards including those established by Section 404 of the Clean Water Act of 1972, as amended (ER 1105-2-100). This constitutes the base disposal plan for the navigation purpose. The Base Plan, as currently developed for the Lorain Harbor navigation project, is discussed further in Chapter 2 and Appendix A of this document.

1.3.3 DMMP Process - A phased plan development process was used to determine the need for and to develop the DMMP for Lorain Harbor. Between 1996 and 2003, Buffalo District completed preliminary evaluations of the District's commercial harbors and identified three harbors in need of a DMMP: Cleveland, Lorain, and Toledo. The Lorain Harbor evaluation was compiled using 1997 data. As a result of the evaluation and prioritization process, Phase I of the Lorain Harbor DMMP began in 2001.

A Preliminary Assessment was conducted to determine whether continuation of O&M of the overall project was warranted, to determine what potential impediments to continued maintenance existed, and to evaluate the consistency of existing environmental compliance documents with ongoing O&M activities (USACE, 2003). The Preliminary Assessment produced a summary of Findings and Recommendations which confirmed that continued dredging and dredged material placement at Lorain Harbor is economically viable (Appendix B). In addition, the Preliminary Assessment determined that there is insufficient space in the operational CDF to contain dredged material for the next 20 years. The Preliminary Assessment therefore concluded that a detailed Dredged Material Management Study should be conducted for Lorain Harbor. The Preliminary Assessment and a Scope of Work (Appendix C) were approved by the Corps of Engineers, Great Lakes and Ohio River Division (CELRD) on April 1, 2003 as the basis for conducting this DMMP study.

1.4 NEPA DOCUMENTATION

1.4.1 National Environmental Policy Act (NEPA) - Federal regulations (40 CFR 1500-1508 and 33 CFR 230) allow planning and National Environmental Policy Act (NEPA) documentation to be integrated within a single report. In the interest of efficiency and cost effectiveness, the DMMP and EIS are combined into one document and will be issued for public review in both draft and final versions (USACE, 1988).

1.4.2 Scoping - The NEPA of 1969 and Council on Environmental Quality (CEQ) regulations implementing NEPA require an early and open process for the public and agencies to provide input to the planning and EIS process for major Federal projects. This scoping process was formally initiated by the widespread mailing of a Public Scoping Information Packet on April 11, 2005 (Appendix D). A summary of the written comments received to date during the scoping process are also included in Appendix D. Individual responses to these scoping comment letters are located in Chapter 6 – Coordination; suggestions and/or concerns have been addressed during the study and incorporated into this DMMP/EIS.

1.4.3 Notice of Intent to Prepare an Environmental Impacts Statement - Due to the complexity, potentially large financial investments (both Federal and non-Federal), potential scale of the project, and considerable public and agency interest, USACE has concluded that

preparation and coordination of an EIS is the best method to comply with the requirements of NEPA. The “Notice of Intent to Prepare a Draft Environmental Impact Statement for a Proposed Dredged Material Management Plan for Lorain Harbor” was published in the Federal Register on March 6, 2007 (Appendix D).

1.5 LOCATION AND HISTORY

1.5.1 Location - Lorain Harbor is located on the south shore of Lake Erie at the mouth of the Black River in Lorain County, Ohio. The harbor is 28 miles west of Cleveland, Ohio and 72 miles east of Toledo, Ohio (Figure 1.2). Lorain Harbor is a major commercial port on Lake Erie. Waterborne traffic at Lorain Harbor consists primarily of the receipt and shipment of bulk commodities. In 2005, total tonnage was 3,055,000 tons. Receipts accounted for 94 percent and shipments accounted for six percent of all traffic. Iron ore has been the dominant commodity moving through Lorain Harbor and in 2005 accounted for 49 percent of all traffic at the harbor. Stone (limestone, gypsum and sand and gravel) accounted for 41 percent and other bulk commodities for the remaining 10 percent of the harbors waterborne bulk traffic.

1.5.2 History – The City of Lorain was first settled in 1807 and was originally named Charleston. The City was reincorporated in 1874 as Lorain, Ohio, taking the same name as the County. Lorain has a long history of shipbuilding. Ships built on the Black River in the 1800’s were used for many different cargoes. Shipping on the Great Lakes was the easiest and best way to move goods before railroads and other passable roads were built later in the century. In 1897, the shipbuilding industry moved to the east side of the river with the establishment of the Cleveland Shipbuilding Company, the precursor of the American Shipbuilding Company. In 1898, they were the largest dry dock on the Great Lakes. On April 13, 1898, the Great Lakes region’s first steel ship, the *Superior City*, was launched. At the time, it was the largest vessel on fresh water. During both World War I and II, ships were built all over the Great Lakes, including Lorain Harbor, in support of the war effort. The American Shipbuilding Company built many net and mine-tenders including the U.S.S. *Lorain*, a minesweeper. Wooden ships were built in Lorain until about 1910. Today, navigation remains the most efficient way to transport bulk materials.

The arrival of the Cleveland, Lorain and Wheeling Railroad in 1872 equipped Lorain to become a steel city. In 1894, agents of Tom Johnson's Steel Street Rail Company of Johnstown, Pennsylvania visited the village of Lorain to evaluate it as a site for a new steel plant. They chose Lorain for its shale bedrock (which provided a strong foundation on which to build large buildings), its protected river, and its access to waterborne and rail traffic. The village agreed to widen, straighten, and deepen four miles of the Black River so ships could reach the mill's docks. On April 1, 1895, the Lorain Mill opened for production, and in 1898 Johnson Steel became Lorain Steel (Black River Historical Society, 2006).

The sprawling United States Steel mills, portions of which were recently acquired by Republic Steel, stretch for nearly three miles on the City's south side. The steel plant was founded in 1895 as Johnson Steel and has undergone several changes in ownership. It is currently owned by a subsidiary of RTI, Grupo Simec of Guadalajara, Mexico. RTI is North America’s leading supplier of special bar quality (SBQ) steel, a highly engineered product used in axles, drive

trains, suspensions, and other critical components of automobiles, off-highway vehicles, and industrial equipment. Lorain Works is one of the few remaining integrated steel mills in the United States. RTI continues to expand and markets products in Mexico and South America. RTI employs approximately 2,500 people and has a steelmaking capacity of 2.3 million tons per year.

In addition to the steel industry, Ford Motor Company operated a plant for many years in Lorain, assembling the Ford Econoline van. However, the plant ceased production on December 14, 2005.



Figure 1.2 – Location of Lorain Harbor, Lorain, Ohio

1.5.3 Lorain Today - Based on the 2005 U.S Census of Population and Housing, total population of the City of Lorain was 65,476, making it the 10th largest city in Ohio (Standard Metropolitan Statistical Analysis, 2005).

1.5.4 Spitzer Lakeside Marina – Spitzer Lakeside Marina is a small boat harbor, completed in 1987 by USACE and the City of Lorain. The marina is located along the East Breakwater Shorearm and existing CDF. Boat docks are adjacent to the long side of the CDF. The marina is privately owned and is advertised as having amenities such as private showers and restrooms, lounge areas, and secure, gated areas.

1.5.5 Port of Lorain – The Lorain Port Authority, established in 1964 by the City of Lorain, manages the Port of Lorain. Lorain Harbor is protected by an Outer breakwater, and East and West breakwaters. Vessels enter the harbor via the Lake Approach Channel (800 feet in width) which leads to the Outer Harbor, and Black River Channel. Paragraph 1.6.2 of this chapter describes the harbor features in detail.

In 2003, the pellet transshipment facility, located in the Outer Harbor relocated to Cleveland Harbor. Six bulk commodity docks remain in Lorain Harbor and are located along the Black River. The Amcor (American Metal Chemical Corp) dock is located on the west bank of the lowermost portion of the Black River Channel at the foot of East 9th Street. The facility provides covered storage capacity of 28,000 tons and receives potash. Upstream of the railroad bridge, on the east side of the river, the Falbo dock receives cement, stone, and gravel to supply a cement ready-mix operation. Upstream of the Falbo dock, also on the east side of the river, is the Jonick dock. This facility is a bulk commodity dock receiving stone and potash, and has covered storage capacity of 40,000 tons. U. S. Gypsum, located on the east bank upstream of Henderson Drive and 21st Street, receives gypsum (rock); the dock has storage for 125,000 tons. Materials received at U.S. Gypsum are processed at National Gypsum's wallboard manufacturing plant in Lorain. Two Republic Technologies Inc. (RTI) docks are located on the west bank of the river. These two docks primarily receive iron ore used to produce hot rolled steel bars at the RTI mill and limestone, to provide the flux charge for the blast furnace (Lorain Port Authority, 2002).

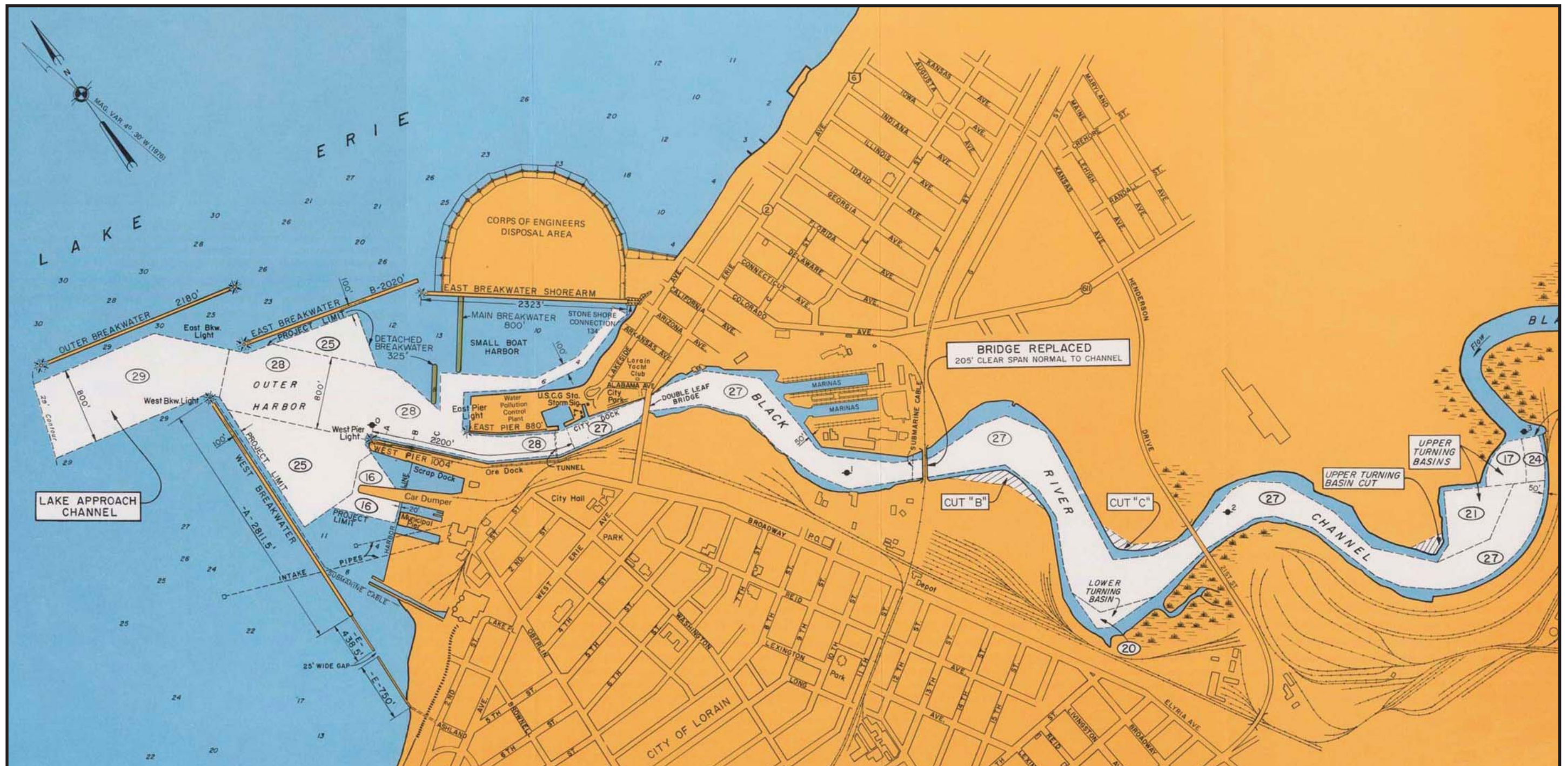
1.5.6 The Future of Integrated Steel Production at Lorain Harbor – Iron ore receipts in 2005 were 1,487,000 tons at the integrated ICH mill in Lorain Harbor. This level of receipts is expected to continue for the foreseeable future. Republic Engineered Products (REP) receives around 200,000 tons of limestone each year. These receipts are also expected to continue for the foreseeable future. Therefore, analyses indicate the steel industry is expected to continue in Lorain Harbor for at least another 20 years.

1.6 FEDERAL NAVIGATION IMPROVEMENTS AT LORAIN

1.6.1 Authorization - The existing Federal navigation project at Lorain was authorized by the River and Harbor Acts of March 3, 1899, March 2, 1907, June 25, 1910, August 8, 1917, July 3, 1930, August 30, 1935, March 2, 1945, July 14, 1960, and November 17, 1986. The CDF was authorized by Section 123 of the Rivers and Harbors Act of 1970 under Public Law [PL] 91-611 and completed in 1978.

1.6.2 Harbor Features – The Outer Harbor is formed by a system of converging breakwaters in Lake Erie and covers an area of approximately 60 acres (Figure 1.3). The breakwaters have a total length of 8,500 feet. The Entrance Channel to the Black River is protected by two parallel piers, located about 1,800 feet from the Outer Harbor entrance. The West pier is 1,004 feet long and the East pier is 880 feet long.

Figure 1.3 - Lorain Outer Harbor and Black River



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The Entrance Channel to the Outer Harbor is via a Lake Approach Channel, 800 feet wide narrowing to 525 feet wide between the East and West piers. Authorized channel depths in this area are 29 feet below Low Water Datum (LWD) (IGLD, 1985) in soft material and 30 feet below LWD in hard material. Authorized channel depths in the Outer Harbor, from the ends of the East and West breakwaters and continuing to a point 2,200 feet above the West Pier Light, are 28 feet below LWD. Also located in the Outer Harbor, is an approach channel leading to the municipal pier. This channel is authorized at 16 feet below LWD. The remaining Outer Harbor Channel has an authorized depth of 25 feet below LWD in soft material and 26 feet below LWD in hard material.

The Inner Harbor includes three miles of the Black River. The width of the channel varies from 200 to 500 feet. Three turning basins are located within the limits of the Federal Channel along the Black River.

Authorized channel depths in the Black River, from a point located 2,200 feet upstream of the West Pier Light to a point 500 feet below the upstream limit of the Federal Navigation Channel, are 27 feet below LWD in soft material and 28 feet below LWD in hard material. The remaining 500 foot portion of the Federal Channel has authorized depths of 24 feet below LWD in soft material and 25 feet below LWD in hard material. The lower turning basin is 650 feet wide and has an authorized depth of 20 feet below LWD. It is located in the bend of the Black River immediately upstream of the former Baltimore and Ohio Railroad coal dock. The upper turning basin, located at the head of commercial navigation, is approximately 690 feet wide with an authorized depth of 17 feet below LWD. Immediately downstream of this location is an enlarged portion of the turning basin with an authorized depth of 21 feet below LWD. Authorized and maintained channel dimensions are presented in Table 1.1

Table 1.1 Authorized and Maintained Channel Dimensions (LWD)					
REACH OR SEGMENT	NOMINAL CHANNEL DEPTH		NOMINAL CHANNEL WIDTH		MAX. SAILING DRAFT
	(as authorized)	(as maintained)	(as authorized)	(as maintained)	
Lake Approach	29' (soft) 30' (hard)	29'	800'	800'	29'
Outer Harbor	28'	28'	800'	800'	29'
East and West portion of Outer Harbor	25' (soft) 26' (hard)	25/26'	Varies	Varies	25'
Municipal Pier Approach Channel	16'	16'	Varies	Varies	--
River Channel	27' (soft) 28' (hard)	27/28'	200'-500'	200'-500'	29'
Upper Turning Basins	17' & 21'	17' & 21'	690'	690'	--
Downstream Turning Basin	20'	20'	650'	650'	--

1.6.3 Investment at Lorain - Since its inception as a Federal harbor in the late 1800's, over \$75 million have been invested in the navigation structures, and dredging and dredged material disposal at Lorain. This includes \$22 million in new work; \$52 million in operations and maintenance; and \$845,000 in non-Federal contributions (USACE, 2005).

1.7 HISTORICAL DREDGING AND DISPOSAL AT LORAIN

Lorain Harbor is generally dredged every two years. The overall historic average at the harbor is approximately 125,000 cy per event. Prior to 2000, an approximate average of 140,000 cy of sediment and since 2000, an approximate average of 58,000 cy of sediment have been dredged each event. The decrease is due to the USACE declining O&M budget which has resulted in a current dredging backlog of 652,000 cy. The impact of reduced dredging is effecting commercial navigation and resulting in navigation safety concerns and light loading of vessels. The impact of three cycles of reduced dredging due to decreased budget has resulted in the need for USACE to complete emergency dredging in Lorain Harbor in 2008 requiring USACE to dredge the harbor in two cycles to provide adequate depth and passage in certain reaches of the river.

Historically, the USACE has employed a number of dredged disposal methods for sediments dredged from the Federal Channel at Lorain Harbor including open-lake placement prior to 1979, and disposal in a CDF after 1979. A CDF refers to a site where specific dredged material is confined in an enclosed space because of the potential for release of contaminants into open water. CDFs can be upland or located adjacent to or as an island along the lakeshore. In practice, due to the high costs of overland transportation of dredged sediments, most CDFs are located along the lakeshores of the Great Lakes.

The CDF at Lorain Harbor is located in the Outer Harbor and was completed in 1978 at a 100 percent Federal cost of \$7,900,000. The facility is 58 acres and has a design capacity of 1,850,000 cy. Since 1979 all dredged material has been placed in the Lorain Harbor CDF.

1.8 RELATED USACE ACTIVITIES AT LORAIN

A number of USACE activities, related to commercial navigation and the dredging and disposal of dredged material, are currently being conducted at Lorain Harbor as described in the following paragraphs.

1.8.1 Dredging Program - The primary objective of the Buffalo District Maintenance Dredging Program is to maintain adequate navigation depths within the authorized Federal Navigation Channel and to meet the expectations of the dredging customers/stakeholders consistent with Federal dredging and disposal rules and policies and available Federal funding. Work includes initial budget development for each specific project, coordination with harbor users, preparation of plans and specifications, obtaining appropriate environmental and regulatory approvals and authorizations, and execution of the dredging contracts. Table 1.2 illustrates dredging quantities which have been placed in the CDF to date. Non-federal dredged material placed in the CDF is negligible and therefore not included in the table.

Table 1.2 – Lorain CDF ANNUAL DISPOSAL QUANTITIES	
Federal Disposal Quantities	
Year	In Place (cy)
1979	138,000
1980	62,782
1981	99,980
1982	106,134
1983	109,557
1984	121,110
1985	164,036
1986	201,250
1987	141,278
1990	133,219
1992	172,756
1995	179,539
1996	152,495
1998	165,000
2000	62,100
2003	61,917
2006	51,217
Total	2,122,370*

*Total quantity exceeds estimated design capacity due to sediment consolidation.

1.8.2 Project Condition Surveys (PCS) - A PCS consists of a hydrographic survey of the federally authorized channels at Lorain Harbor. The Buffalo District generally conducts the depth surveys using small craft positioned by differential global positioning system (GPS) to survey harbor depths accurate to 1/10 of a foot. Surveys are usually conducted prior to and after dredging to confirm depths and the amount of material dredged. The data is processed in the Buffalo District New York and Pennsylvania O&M Area Office. Products from the survey data made available include maps in hard copy form, portable document format (PDF), "Notice to Navigation Interests", metadata, and digital computer aided drafting and design (CADD) files. PCS data for Lorain Harbor is available through the Buffalo District web site at <http://www.lrb.usace.army.mil/WhoWeAre/WaterMgmt/survey/2007data.html>

1.8.3 Real Estate Management - The Detroit District Real Estate Office accomplishes the real estate mission of the Buffalo District by managing Lorain Harbor, Ohio, real property holdings under the control, care, and custody of the Buffalo District. Real estate management activities include granting to others the use of property, appraising, when necessary, to determine fair market value, negotiating the terms of and executing the real estate outgrant document; performing compliance inspections of outgranted property, completing compliance inspection reports, and taking corrective measures in instances of noncompliance; executing outgrant renewals and cancellation/termination documents; performing utilization inspections of real property under the control of the USACE; reconciling real estate and financial records to

maintain compliance with the Chief Financial Officer's (CFO) findings on real property accountability, and performing real property physical inventories; responding to general inquiries relating to real property.

1.8.4 Structure Maintenance - The harbor is protected by a breakwater system: an Outer breakwater (2,180 feet long), a West breakwater (4,000 feet long), an East breakwater (2,020 feet long), and an East breakwater shorearm (that extends 2,323 feet). Two piers extend from the mouth of the Black River into the harbor. The USACE maintains the breakwater (pier) system through both contract and in-house labor. Maintenance work on breakwaters has been performed by government equipment and personnel and by contract with private marine construction companies.

Breakwater and pier repairs are required to maintain the structural integrity of the navigation system and ensure that the navigation project functions properly. The structures protect the harbor shoreline, aids to navigation, docks, and businesses. The structures suffer annually from both wave action and ice damage which causes deterioration of the rubble mound/laid up stone, loss of core stone, and damage to steel sheeting. Repairs are required to ensure harbor traffic and lakefront infrastructure remains protected. Without the breakwater and pier structures in good condition, the harbor has an increased potential for shoaling, unsafe navigation, dangerous mooring, and bank erosion. The structures provide a foundation for, and protection to, aids to navigation (harbor lights, lighthouses, etc.).

1.8.5 Management of the Existing CDF at Lorain - Lorain Harbor CDF, a federally owned and operated facility, was constructed in 1978 and filled to original design capacity in 2006. In accordance with Section 148 of WRDA 1976, implementation of a FMP will enable USACE to continue to operate the CDF for three additional biennial dredging cycles (2008, 2010, and 2012). The USACE will own and operate the CDF until it is filled to capacity and then turned over to the City accompanied by an O&M manual. A new facility or disposal alternative, to be recommended by this DMMP, is expected to be operational in 2014.

1.8.5.1 FMP - The proposed FMP involves three phases to be implemented in 2007, 2009, and 2011. Each phase includes grading existing dredged material within the CDF to create four to six foot perimeter lifts (i.e. berms). The top elevation of the first, second, and third phases will be +17, +23, and +29 LWD, respectively. Each phase will provide additional capacity of approximately 150,000 cy. A minimum two feet free board shall be maintained over the entire area (USACE, 2005). The FMP has been coordinated with the City of Lorain to ensure it is consistent with the City's CDF Master Plan. On September 7, 2005, Ohio Department of Natural Resources (ODNR) issued a Coastal Management Program Consistency Determination to USACE for FMP activities.

Under the authority of Title 16, USC Section 460d, The Port Authority leases the use of a USACE pier in the harbor. Per condition number 12, USACE collects a fee amount (or in-kind services in place of the fee), based on an appraisal of the pier and how the pier structure benefited and continues to benefit the Lorain Port Authority marina. These services in lieu of fees are \$13,800 per year. In April 2005, the Port

Authority constructed approximately 300 linear feet of the FMP as in-kind services in lieu of fees. The Port Authority planned to complete additional in-kind services at the CDF in 2006, however an unseasonably wet summer prevented the work. In July 2007, the Port Authority issued a contract for brush clearing around the perimeter of the CDF to facilitate berm construction.

1.8.5.2 Other Best Practices - Effective site management could add additional capacity to the CDF and includes strategic placement of dredged material during disposal operations, trenching to accelerate drainage, and use of the weir.

1.8.6 Risk Assessment – In 2004 sediment and water samples were analyzed within the CDF and in the waters immediately adjacent to the facility, in support of a contaminant monitoring assessment of the CDF. This assessment was performed in order to determine whether or not further management action needs to be taken at the dredged material CDF under the jurisdiction of USACE, Buffalo District in order to ensure protection of human health and the environment. This evaluation followed a tiered approach, utilizing guidance from *Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities – Testing Manual* (UTM) (USACE 2003). The first tier was completed in September 2005. Tier three evaluation was completed in 2006. The complete report is in Appendix E. The preliminary draft results indicate that water quality outside the CDF is compliant with Federal and State water quality standards and contaminated sediment in the CDF is below numerical criteria deemed suitable for beneficial uses. However, at this time the suitability of the sediment and CDF facility for beneficial uses, including recreation, may not be determined acceptable based solely on the results of the 2004 assessment. It is recommended that prior to beneficial use of the CDF, and/or sediment within it, for recreational use, including habitat for wildlife, additional studies and assessments should be completed.

1.8.7 Sediment Sampling Analysis - Sediment sampling in Lorain Harbor is typically conducted once every five years. Samples are analyzed for physical, chemical, biological, and toxicological parameters. The purpose of the sediment sampling is to assess the sediment contamination levels and determine suitability of the material dredged from the Federal Channel for disposal in a CDF, or placement in the designated open lake or nearshore sites. Based on 2005 sediment sampling results and 2006 bioassay analysis, all Outer Harbor sediments and the lower two miles of Black River Channel sediments (lakeward of Station 143+47), totaling approximately 68 percent of the Federal Channel, were approved for open lake placement by the State of Ohio. Appendix F provides sediment sampling and bioassay results and Chapter 3 provides a detailed sediment analysis.

1.9 ECONOMIC JUSTIFICATION OF CONTINUED HARBOR MAINTENANCE

1.9.1 Lorain Harbor Economic Evaluation – As part of the overall DMMP/EIS effort, an economic evaluation of continued harbor maintenance has been conducted (Appendix G) and is summarized below. The purpose of the economic evaluation is to determine if continued maintenance of the harbor is justified and to develop a system for ranking (economically) the various DMMP alternatives developed during this study. Economic benefits attributable to continued maintenance of Lorain Harbor consist of savings in transportation costs that would be

expected with increased channel depths provided by dredging the Federal Navigation Channel. The analysis has been based on tonnages moved through Lorain Harbor during the 2005 shipping season; total tonnages were 3,055,000 tons. These commodities accounted for 89.5 percent of the tonnage moving through the Harbor in 2005 and were used to develop net benefits associated with continued maintenance of the harbor. The remaining 10.5 percent consist of commodities transported via vessels whose operating characteristics and origin ports are not readily identifiable. A summary of 2005 tonnages, by commodity, is provided in Table 1.3.

Table 1.3 – Lorain Harbor Tonnages – 2005	
Commodity	Tons
Iron Ore	1,487,000
Limestone	968,500
Gypsum	193,300
Coal	44,600
Salt	40,300
Other	321,300
Total	3,055,000

There have been major changes in tonnages moving through Lorain harbor since 2001, and all of it is due to changes in iron ore movements. The majority of the iron ore historically received at Lorain Harbor (about 70 percent) has been destined for an integrated steel mill located in Cleveland Harbor Ohio, on the Cuyahoga River. By 2003 the Lorain pellet terminal transshipment facility had been bought by the integrated steel mill in Cleveland Ohio, and completely relocated to Cleveland Harbor. Lorain Harbor no longer had any iron ore transshipments. Total tonnages moving through the Harbor fell to 3m tons in 2005. This loss of tonnages at Lorain Harbor needed to be acknowledged and reflected in the tonnages used in the economic evaluation. This has been done by using 2005 tonnages that have passed through Lorain Harbor. These tonnages reflect the loss of the outer harbor iron ore transshipment facility to Cleveland, as well as a reduced level of iron ore and limestone needs at the current ICH steel making facilities at Lorain. Currently, ICH steel making facilities at Lorain only use one blast furnace to produce steel. The amount of iron ore and limestone needed to run this one blast furnace is represented by 2005 tonnages of iron ore and limestone that were delivered in 2005. These 2005 levels of iron ore and limestone were used in the economic analysis of the harbors viability.

1.9.2 Vessel Transportation by Channel Depth – There were around 300 commercial vessel movements (inbound and outbound) in 2005. Approximately 75 percent of the inbound vessel movements drafted 23 feet or greater. This level of vessel activity is expected to continue over the project evaluation period 2009-2028.

The 2005 tonnages and corresponding vessel movements were used to develop the vessel transportation costs associated with dredging Lorain Harbor to various depths. The actual vessels used to move these commodities were identified, as well as the origin and destination routes. Channel depths investigated range from authorized maintenance depths (27 feet below

LWD on the Black River) to channels with up to six feet less of water column in one foot increments. Shoaling of channels requires shippers to load their vessels with fewer commodities or to use smaller vessels thereby increasing transportation costs for movement of that commodity. Based on 2007 dollars, transportation cost increases associated with reductions in channel depth from one to six feet were calculated and are illustrated in Table 1.4.

Table 1.4 – Lorain Harbor Increase in Vessel Transportation Costs							
Commodity	Maintained Channel Depth 27 feet	Maintained Channel Depth 26 feet	Maintained Channel Depth 25 feet	Maintained Channel Depth 24 feet	Maintained Channel Depth 23 feet	Maintained Channel Depth 22 feet	Maintained Channel Depth 21 feet
Iron Ore	\$10,109,577	\$10,157,746	\$10,424,332	\$10,923,109	\$11,542,408	\$12,216,680	\$12,965,373
Limestone	\$2,089,158	\$2,092,101	\$2,100,829	\$2,139,560	\$2,194,058	\$2,261,286	\$2,340,182
Gypsum	\$1,080,104	\$1,080,104	\$1,080,104	\$1,080,104	\$1,080,104	\$1,080,104	\$1,080,356
Coal	\$194,725	\$196,380	\$200,872	\$208,713	\$218,636	\$229,880	\$242,454
Salt	\$108,484	\$109,804	\$113,787	\$119,477	\$125,943	\$132,640	\$139,321
Total Cost	\$13,582,048	\$13,636,135	\$13,919,924	\$14,470,963	\$15,161,149	\$15,920,590	\$16,767,686

1.9.3 Without Project Condition Average Annual Transportation Costs - The increases in vessel transportation costs were used to develop vessel transportation cost time streams for the Outer Harbor and River Channel based on a 20 year project evaluation period. A shoaling rate of one foot per year was assumed in the analysis. The river channels equilibrium channel depth was assumed to be 21 feet. The equilibrium channel depth is defined as the depth at which the harbor channel would eventually shoal to if dredging were to cease. These time streams were converted to average annual values using a 20 year project life and a 4.875 percent annual interest rate. Assuming no maintenance of Lorain Harbor channels for the next 20 years, the without project condition average annual transportation costs are \$15,802,700 (Table 1.5).

1.9.4 Average Annual Harbor Transportation Cost Savings – Average annual harbor transportation cost savings associated with continuing to maintain harbor channel depths is the difference between without project condition (\$15,802,700) and currently maintained depths of 27 feet (\$13,582,048). Average annual harbor transportation cost savings associate with maintaining a 27 foot channel depth are \$2,220,700 (Table 1.6).

Table 1.5 Lorain Harbor Without Project Condition Average Annual Vessel Transportation Costs by Commodity	
Commodity	Without Project Condition Average Annual Transportation Costs
Iron Ore	\$12,103,900
Limestone	\$2,259,700
Gypsum	\$1,080,300
Coal	\$228,200
Salt	\$130,600
Total Costs	\$15,802,700

Table 1.6 Average Annual Harbor Transportation Cost Savings Associated with Maintaining a 27 Foot Channel Depth			
Commodity	Without Project Condition	With Project Condition	Average Annual Transportation Benefits
Iron Ore	\$12,103,900	\$10,109,600	\$1,994,300
Limestone	\$2,259,700	\$2,089,200	\$170,600
Gypsum	\$1,080,300	\$1,080,100	\$200
Coal	\$228,200	\$194,700	\$33,500
Salt	\$130,600	\$108,500	\$22,100
Total	\$15,802,700	\$13,582,000	\$2,220,700

1.9.5 Net Harbor Benefits – Net harbor average annual benefits can be calculated by subtracting average annual dredging costs from average annual harbor transportation cost savings. These net benefits can then be converted to equivalent first costs, which represent the investment that can be supported by Lorain Harbor. According to the net harbor benefits calculation, the harbor can support improvement projects of \$21 million (Table 1.7).

Table 1.7 Lorain Harbor Viable Project Improvement Costs				
Average Annual Harbor Benefits	Total Average Annual Harbor Costs	Net Average Annual Benefits	Present Worth of 1\$/Period	Coverable Project Costs
\$2,220,700	\$541,300	\$1,679,400	13	\$21,152,600

1.9.6 Conclusion From the Economic Evaluation – In conclusion, the economic evaluation has determined that the continued maintenance dredging of Lorain Harbor and Black River Channel, including construction of facilities for dredged material disposal up to a construction cost of \$21 million is economically justified.

1.10 LOCAL SPONSORS AND CUSTOMERS

The primary external customers, and presumed non-Federal cost-sharing partners, for this DMMP and ultimate implementation of a new dredged material management facility and/or method are the City of Lorain and Lorain Port Authority. Other customers include Federal, State, and local agencies including the U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USFWS), ODNR, and Ohio Environmental Protection Agency (OEPA).

Additional customers include Lorain County MetroParks, Lorain City Council, City of Lorain – Mayor’s Office, Republic Steel, Clean Ohio Fund, and the Black River Remedial Action Program (RAP).

The customer expectation is to have the USACE, Buffalo District continue to dredge Lorain Harbor and Black River up to the Upper Turning Basin which will require disposal of dredged material in an environmentally acceptable manner. Dredging in Lorain Harbor is typically performed every other year and sometimes less due to USACE funding constraints.

1.10.1 Remedial Action Plan - The Black River is one of 43 rivers identified in the Great Lakes Water Quality Agreement as an Area of Concern (AOC). The purpose of the Great Lakes Water Quality Agreement is to clean up the most polluted tributaries in the Great Lakes and commit the respective State(s) and Province(s) to developing RAPs for the designated AOCs. In 1991, OEPA organized the Black River RAP whose mission is to restore the environmental quality of the river through remediation of existing conditions, and implement pollution prevention techniques to minimize further degradation of the water quality. Originally, the Black River AOC only included the lower mainstream. However, point source pollution from local industry and elevated contamination levels of PAHs and metals causing tumors in the local fish population resulted in expanding the AOC to include the entire Black River watershed. The overall goal of the RAP is to remove the Black River from the list of Great Lakes AOCs. Currently 39 stakeholders are active participants in the Black River RAP and include government agencies, businesses, local community groups, and citizens interested in protecting and conserving the waters of the Black River and its watershed. The watershed approach has been a great success resulting in national and international awards. More importantly, in 2005, USEPA approved delisting of the Degradation of the Benthos Beneficial Use Impairment in the East Branch of the Black River.

1.11 RELATIONSHIP TO LOCAL PLANNING EFFORTS

1.11.1 Introduction – A number of local planning efforts related to the Lorain waterfront are currently underway. This DMMP/EIS will give full consideration to identified local planning initiatives in ultimately recommending a method and site for the disposal of dredged material from Lorain Harbor. Known and current major local waterfront planning efforts are described in the following paragraphs.

1.11.2 Feasibility Study for Black River Waste Water Treatment Plant (WWTP)

Relocation – The City of Lorain is under Findings and Orders from the Ohio EPA, with established deadlines for eliminating numerous sanitary sewer overflows (SSOs) in their collection system. In 2006, the City contracted Malcolm Pirnie to conduct a feasibility study for the relocation of the Black River WWTP. The feasibility study includes an array of wastewater treatment and conveyance alternatives, and a cost and funding evaluation. The study was funded by the U.S. Department of Commerce through a State of Ohio grant. Coordination with the City of Lorain indicates that the selected alternative will be to move the Black River WWTP from the mouth of the harbor to the RT-2 brownfields site. The conceptual layout is for a “single plant” alternative to occupy approximately 40 acres of the total 130 acre parcel which will meet projected requirements in the year 2025. The probable construction cost of this alternative, in 2006 dollars, is \$212 million. The report enumerates a variety of potential funding sources from State and Federal grants and loans. Additional funding sources are rate increases to users and the issuance of bonds.

1.11.3 Lorain CDF Master Plan – When the existing Lorain CDF was built in 1978, the City created a Lorain Task Force comprised of State and local regulators, industry, recreational groups, individuals and others with an interest in the project. The Task Force has identified end use alternatives for the CDF once it is transferred to the City of Lorain. In October 2006, the City received a State of Ohio grant to develop a Master Plan for the CDF.

1.12 INTERAGENCY COLLABORATIVE PLANNING

1.12.1 Introduction – In accordance with EC 1105-2-409 the USACE uses its planning capability to facilitate, convene and advise, and to work collaboratively with other Federal and State programs in developing solutions that integrate programs, policies, and projects across public agencies. This DMMP/EIS will give full consideration to ongoing collaborative planning initiatives in ultimately recommending a method and site for placement of material dredged from Lorain Harbor. Known and current collaborative planning efforts are described in the following paragraphs.

1.12.2 Sediment Transport Model - Since 2003, the USACE has partnered with various Federal, State, County, and local interests to develop, under 516(e) Great Lakes Tributary Sediment Transport Modeling Program, a Black River Watershed model. The purpose of the modeling tools is to identify and implement measures to reduce sediment loads from identified sub-watersheds that produce the greatest sediment yields. The model was complete and transferred to Ohio Environmental Protection Agency (OEPA) in Fiscal Year 2007 (the Federal fiscal year runs from October 1st to September 30th). The USACE will continue to be involved by offering training, technical support, and guidance on use of the model. Once implemented, benefits would not be realized for a minimum of 10 years. There would be minimal impact on the sediment load during the DMMP study evaluation period.

1.12.3 Environmental Site Assessment - In November 2004, USACE conducted an Environmental Site Assessment (ESA) at four brownfields located along the Black River. The ESA was performed in accordance with provisions found in American Society for Testing Materials (ASTM) E1527-00 *Standard Practice for Environmental Site Assessments: Phase 1*

Environmental Site Assessment Process. (USACE, 19 Nov 2004). The assessments were completed at three properties formerly owned by Republic Technologies Inc. and one site called Burrell Homestead. The study included property site assessment and inventory, topography, geology, and hydrogeology investigations including effects to local drinking water supplies. ESA findings summarized past and present environmental concerns. This assessment was completed in cooperation with the City of Lorain.

1.12.4 Black River Preliminary Restoration Plan - In 2005, USACE completed a Preliminary Restoration Plan for the Black River under the Continuing Authorities Program, Section 204, Beneficial Uses of Dredged Material. This study investigated upland placement of dredged material on the Republic Engineered Products Inc. brownfields and aquatic ecosystem restoration of small segments of the Black River. USACE actively engaged the City of Lorain, Lorain Port Authority, and State environmental agencies during the feasibility phase of the study. In January 2007, the USACE folded the study alternatives into the broader DMMP/EIS analysis and the Sec. 204 study was terminated.

1.12.5 Black River Mainstream Redevelopment Plan – In 2007, OEPA and City of Lorain began collaborating with Federal, State, and local entities to discuss the importance of developing a plan to ensure the sustainability of the mainstream of the Black River. USACE became actively involved and plans to continue participation in the Black River Mainstream Redevelopment Plan. A committee has been organized to develop a Request for Proposals from consulting firms to aid in development of the plan. The redevelopment plan will consider USACE dredging operations and DMMP, City of Lorain CDF Master Plan, City WWTP relocation initiative, RAP restoration activities, as well as other local initiatives to enhance river sustainability.

1.12.6 Regional Sediment Management Strategy - The Regional Sediment Management (RSM) Strategy is a program developed to investigate sedimentation in Lake Erie and Lake Ontario. The RSM Strategy consists of four key parts including outreach to educate coastal engineering personnel on RSM issues and concerns; identify existing conditions, problems and opportunities for RSM in the Lower Great Lakes; apply for National Regional Sediment Management Demonstration Program (NRSMDP) funding to implement demonstration projects to harvest sand for beneficial use; and prepare a scope of work to develop regional sediment budgets within USACE Great Lakes Districts. Project sponsors include New York and Ohio Coastal Zone Management Offices, EPA, Great Lakes National Program Office, Lake Erie and Lake Ontario Lake Management Plans (LaMPs), National Oceanic Atmospheric Administration (NOAA), and Great Lakes Ports and Carriers. Although this program is in the preliminary stages, once implemented, benefits would not be realized for a minimum of 10 years. There would be minimal impact on the sediment load during the study evaluation period.

2.0 – PLAN FORMULATION

PURPOSE AND STUDY AREA

2.1 Study Purpose - The purpose of this DMMP/EIS is to determine if there is a Federal and non-Federal justification and interest in developing a plan for continued maintenance dredging and placement of dredged material from the Federal navigation channel at Lorain Harbor, Ohio. The study will formulate and evaluate the cost-effectiveness and economic and environmental impacts of alternative plans for dredged material management at Lorain Harbor. This study will also present the results of investigations to provide a plan for a minimum of 20 years capacity of dredged material placement at Lorain Harbor.

2.2 Lorain Harbor, Ohio – Refer to Chapter 1, paragraph 1.6.2 for a detailed description of Lorain Harbor.

2.3 Congressional Districts – Lorain Harbor is located within the Congressional District of Representative Betty Sutton (OH-13-D), Senator George Voinovich (R-OH), and Senator Sherrod Brown (D-OH).

2.4 Defined Study Area – Since Lorain Harbor is a deep-draft commercial navigation project it serves and provides commerce to the entire Great Lakes and in fact participates in international commerce and commodity transportation through the St. Lawrence Seaway. For the purposes of dredged material management at Lorain Harbor, the primary study area has been narrowed to the immediate Lorain area as described below. In general, high transportation costs for channel bottom sediments dredged from the harbor limit the distances it can be transported economically, limiting viable options for dredged material management.

- Lorain Harbor, Ohio – Includes the Federal navigation channel in the Black River (upriver about 2.8 miles); the Outer Harbor, and all sites used previously and today for the confinement of sediment dredged from the harbor.
- Lorain Waterfront – All shoreline areas west to Lakeview Park and to the City limits east of the existing CDF.
- Lake Erie – Deep water areas offshore of Lorain to a maximum depth of approximately 30 feet below LWD.

2.5 PLAN FORMULATION

2.5.1 Six-Step Planning Process - This DMMP/EIS study is being conducted consistent with guidance provided in USACE Engineer Regulation (ER) 1105-2-100, the Planning Guidance Notebook (USACE, 2005). In brief, the guidance requires a six-step planning process as outlined below:

Step 1 – Identifying problems and opportunities

Step 2 – Inventorying and forecasting conditions

- Step 3 – Formulating alternative plans
- Step 4 – Evaluating alternative plans
- Step 5 – Comparing alternative plans
- Step 6 – Selecting a plan

The planning process is iterative as a study progresses. At this stage (Draft DMMP/DEIS), emphasis in the planning process has been placed on steps one through five. Final selection of a plan will come after review of these documents and preparation of the Final DMMP/FEIS.

2.6 PROBLEMS AND OPPORTUNITIES

2.6.1 Step 1 - Identifying Problems and Opportunities – A number of water resources problems and opportunities have been defined, to date, as part of this study and in prior studies involving Lorain Harbor, Ohio. They include the following:

2.6.1.1 PROBLEMS

- The current state of filling of Lorain Harbor CDF (which was filled as of 2006 and will not be usable in the future unless further CDF management measures are undertaken after 2006).
- Portions of the channel bottom sediments from Lorain Harbor are not suitable for open-lake placement and must be placed in a CDF.
- The difficulty in locating a new CDF(s) in Lorain Harbor for the confinement of sediment dredged from the Federal navigation channels.
- The high cost of planning, design, and construction of a new CDF(s) for dredged material at Lorain Harbor.

2.6.1.2 OPPORTUNITIES

- The use of significant amounts of dredged material from Lorain Harbor for productive purposes, rather than placement in CDFs (defined as “Beneficial Use of Dredged Material”).
- The opportunity to incorporate local planning efforts into a major Federal action.
- Sediments in the Outer Harbor and part of the River Channel now meet Federal guidelines for open-lake placement (From 1979 through 2005 all sediment from the Federal channels required disposal in the CDF).

2.7 PLANNING OBJECTIVES AND CONSTRAINTS

2.7.1 Study Planning Objectives – Planning objectives are statements that describe the desired results of the planning process by solving the problems and taking advantage of the opportunities identified. The planning objectives must be directly related to the problems and opportunities identified for the study and are used for the formulation and evaluation of plans. All study objectives are framed in terms of the Federal objective and specific study planning objectives (USACE, 2005). The Federal objective for water resources projects, as defined in the Principles and Guidelines (USWRC, 1983), is provided below:

“The Federal objective of water and related land resources project planning is to contribute to national economic development consistent with protecting the Nation’s environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements”.

2.7.2 Specific Study Objectives – The following specific study planning objectives have been developed:

- To develop and evaluate alternative plans and programs to maintain the authorized navigation channel in the Outer Harbor and Black River at Lorain Harbor for a minimum period of 20 years.
- To develop and evaluate alternative measures and plans for managing Lorain Harbor dredged material in the least costly, environmentally acceptable, and if possible, beneficial manner utilizing sound engineering practice.
- Alternative plans should maximize the use of the existing Federal CDF at Lorain Harbor.
- The minimum capacity of any plan involving construction of a new CDF should be 15 years (2014 through 2028) or the equivalent of eight dredge cycles, assuming the plan incorporates the interim FMP.
- Alternative plans should be commensurate with the City of Lorain’s CDF Master Plan.
- Plans should minimize the relocation and/or disruption to public and private entities.
- Plans should provide a short-term (2009 to 2013) solution for the management of dredged material.
- Plans should provide an operational alternative no later than 2014.
- Plans should minimize the impacts and effects to aquatic habitat.

- Plans should minimize initial construction costs and 20-year operations and maintenance costs.
- Plans should minimize social and physical impacts to the City of Lorain (i.e., trucking materials through the City).
- Plans should avoid impacts to combined sewer overflows, water intakes, and sewer line outfalls.

2.7.3 Planning Constraints – Constraints are restrictions that limit the planning process. Some general types of constraints that were considered are resource constraints and legal and policy constraints. Resource constraints are those associated with limits on knowledge, expertise, experience, ability, data, information, money, and time. Legal and policy constraints are those defined by Federal law, USACE policy and guidance [ER 1105-2-100, paragraph 2-3.a (5)]. Planning is not constrained by State, regional, and local laws and policies, but consideration of such will be discussed in relation to the different alternatives. Alternative plans are formulated to meet study objectives and avoid violating constraints.

The following constraints have been identified for this study:

- It is not acceptable to place dredged material, which does not meet the Federal guidelines in the open waters of Lake Erie. Section 404(b)(1) of the Clean Water Act (CWA) defines these guidelines.
- Planning actions and capital development projects will be subject to financial constraints and availability of funds, both Federal and non-Federal. This DMMP is funded on an annual basis through the USACE O&M accounts.
- The DMMP/EIS must address all requirements of Federal law including NEPA, Section 404 of the CWA, and Coastal Zone Management Act.
- The quality of dredged material could limit options for beneficial use.

2.7.4 Step 2 – Inventorying and Forecasting Conditions – Step 2 of the planning process involves inventorying of study area resources including the economic, social, demographic, physical, and ecological resources in the planning area. In addition, a forecast of the future without project conditions is conducted. The future without project conditions provides the basis from which alternative plans are formulated and impacts assessed (USACE, 2005).

2.8 EXISTING CONDITIONS

A discussion of the environmental, socio-economic, and economic conditions of the Lorain Harbor study area is presented in Chapter 3 -Affected Environment of this report.

2.9 WITHOUT PROJECT CONDITIONS

2.9.1 Without Project Conditions Defined – Without project conditions are defined as the economic, social, and environmental conditions that would be expected in the study area during the period of analysis, in the absence of a plan, for dredged material placement. For the purposes of this DMMP study, the period of analysis is 20 years from 2009 through 2028. It provides the basis for estimating benefits of each alternative plan (With Project Conditions). Without project conditions are a benchmark to measure the economic, social, and environmental effects of the alternative plans considered. The without project condition assumes that normal O&M of the Federal navigation project at Lorain Harbor would cease after the 2008 dredging cycle. At this time, Lorain Harbor CDF will have reached 100 percent capacity through implementation of the first FMP. Since there are no additional operational USACE CDFs available at Lorain Harbor, there would be no dredging or breakwater maintenance by the USACE over the 20-year project evaluation period of 2009 through 2028

2.9.2 Key Assumptions for the Without-Project Conditions – A number of key assumptions concerning the without project conditions have been developed for this study. Those key assumptions are as follows:

2.9.2.1 Key Assumption 1 -Lorain Harbor with Federal Dredging Eliminated – As previously discussed, Lorain Harbor is a major commercial port on Lake Erie requiring a significant biennial expenditure of Federal funds for maintenance dredging and placement of dredged sediment. The key assumption is that maintenance of Lorain Harbor, requiring dredging approximately 150,000 cubic yards of material every other year, would no longer be undertaken by the Federal government (USACE) if a dredged material placement location cannot be determined.

As channel depths become shallower, commercial navigation channels would shoal in, particularly in the Black River, and commercial navigation users would have to light load vessels that use Lorain Harbor. In addition, the Federal breakwater and pier structures at Lorain would no longer be maintained. It is highly unlikely that any State or local agency would have the funding necessary to provide for the upkeep of the commercial navigation project at Lorain Harbor. Although not constructed as their primary purpose, the Lorain Harbor breakwaters provide significant shoreline protection from storm driven waves of Lake Erie. Without maintenance, the breakwaters would eventually deteriorate exposing the Lorain shoreline with its major infrastructure (e.g. water intakes, sewer outfalls) and attractions (e.g. marinas, yacht clubs, restaurants) to the damaging effects of storm driven waves.

2.9.2.2 Key Assumption 2 -Lorain Harbor as a Viable Commercial Navigation Project - Based on 2005 tonnage data, continued maintenance dredging is economically justified. Industry would be serviced by water transportation networks to receive raw material and bulk commodity inputs over the 20 year evaluation period.

2.9.2.3 Key Assumption 3 -Quality of the Dredged Material – Based on 2005 sediment analysis of sediment dredged from the Federal navigation channels at Lorain Harbor, Outer

Harbor sediments and Black River sediments, lakeward of Station 143+47 (totaling 68 percent of the Federal channel), currently meet the Federal guidelines for open-lake placement, and remaining sediments (32 percent) from the Black River Channel, landward of Station 143+47, including the Upper Turning Basin require confinement. Based on the most recent chemical sediment data, current industry and land use along the river, respective discharges and runoff associated with the properties, and State and Federal standards regulating point and non-point source discharges, Key Assumption 3 implies that there will be no significant sediment quality improvement in the Black River Channel landward of Station 143+47, including the Upper Turning Basin over the next 20 years. There is no indication that the industrial land use and level of contamination and loading would change during the project evaluation period. Therefore, all sediment dredged from this portion of the harbor will not be suitable for open-lake placement in the foreseeable future.

2.9.2.4 Key Assumption 4 - Quantity of the Dredged Material – In conjunction with Key Assumption 3, sediment from the lower 68 percent of the Federal channel will be suitable for open-lake placement and sediment from the upper 32 percent of the Federal channel will be unsuitable over the 20-year study period.

2.9.2.5 Key Assumption 5 - Future Availability of the Existing CDF – In November 2006, the City of Lorain obtained a State of Ohio grant to develop a feasibility study for the future use of the existing Lorain Harbor CDF. Key Assumption 5 assumes the existing Federal CDF will be filled and transferred to the City of Lorain by 2014 and will no longer be available to the USACE for dredged material placement.

2.9.2.6 Key Assumption 6 - Breakwater Maintenance Costs – There would be no significant breakwater maintenance costs included in the economic evaluation of the plans over the 20-year study period of 2009 through 2028. The reason for this assumption is because major rehabilitation of the Lorain Harbor breakwater system was completed in 2003. The expected project life of the repairs is 30 years. Therefore, the next scheduled O&M activity on the breakwaters would occur after the study period end date of 2028.

2.9.3 Without Project Conditions – The currently envisioned without project condition is described below (based on a 20-year period of analysis from 2009 through 2028).

- Without a dredged material placement area or method, Federal dredging of the Federal navigation channels would not occur.
- Open-lake placement of suitable dredged material would cease.
- Gradual reduction of channel depths at the Port of Lorain would occur.
- Economic losses to industry dependent on commercial navigation at Lorain Harbor would occur.
- The existing Federal CDF would be transferred to the local sponsor upon reaching capacity and developed by them in a manner consistent with the City's CDF Master Plan.

- Federal breakwaters at Lorain Harbor would not be maintained and would eventually deteriorate.
- Deteriorated breakwaters would create shoreline protection problems to infrastructure located along the Lorain waterfront.
- Federal and State environmental regulations and policies aimed toward pollution prevention, clean water and air, and environmental mitigation requirements would not eliminate point and non-point source discharge in the Black River.
- Contaminated sediments would not be removed from the Black River Channel and Upper Turning Basin and would eventually migrate to the Outer Harbor and Lake Erie.

2.10 ALTERNATIVE MANAGEMENT MEASURES AND PLANS

2.10.1 Step 3 – Formulating Alternative Plans (Management Measures) – The first step in the Plan Formulation process is identifying management measures that may be implemented to meet some or all of the objectives of the DMMP. Management measures can be combined in various fashions to formulate alternative plans. Management measures can be structural and non-structural in nature. The management measures developed for this study are described below. Based on the objectives and constraints defined for this study, some preliminary alternative plans have been developed by combining management measures and are described in later paragraphs. To avoid confusion, management measures will be identified by a capital letter designation (e.g., Measure A, B, C and in some cases for sub-measures with a capital letter and number) while alternative plans will be designated numerically (e.g., Alternative Plan 1, 2, 3).

- 2.10.1.1 Measure A – No Action: Under this measure, the Federal Government would do nothing to address the need for future placement of dredged material. Dredging of the Federal navigation channels would cease in 2009. Since dredging would cease, there would be no FMP expenditures over the life of the project evaluation period, 2009-2028. Without dredging, the Federal navigation channels would progressively shoal in and would result in reduced channel depths for commercial vessels. Reduced channel depths would result in light loading commercial navigation vessels over the 20-year evaluation period.
- 2.10.1.2 Measure B – Beneficial Use: Beneficial use of dredged material is defined as “utilizing dredged sediments as resource materials in productive ways”. Beneficial uses of dredged material have been classified into three broad categories: (1) engineered uses; (2) agricultural and product uses; and (3) environmental enhancement (USACE, 2006). Beneficial use of dredged material allows for recycling dredged sediment, particularly where the dredged material are not contaminated or only mildly contaminated (Great Lakes Commission, 2006). Beneficial use of dredged material includes recreation, agricultural and habitat development, beach nourishment, and innovative engineering alternatives such as the manufacture of soil from dredged material. Beneficial use plans must

be technically and economically feasible, have public support, and comply with all applicable legal and regulatory requirements.

- 2.10.1.2.1 Measure B1 – Littoral Nourishment: In cases where dredged material is primarily sandy and inherently contains little or no chemical contamination the dredged sands can often be used to nourish the littoral system. Littoral nourishment can be effective in eroded shoreline areas and in situations where non-Federal interests are willing and capable in sharing the additional costs of littoral nourishment if the cost of this alternative is greater than the cost of other disposal options that meet the Federal standard.
- 2.10.1.2.2 Measure B2 – Soil Manufacture: The concept of manufacturing soils using dredged material, often mixed with yard wastes or other biosolids, has been widely tested and has proven successful with smaller amounts of dredged material (up to 50,000 cubic yards) (Lee, undated). The success of manufacturing soil depends upon the contamination levels present in the dredged material, the amount of decontamination and processing that would be required and a ready market for the soil produced. The manufactured soil produced might range from poor quality only suitable for landfill cover to high quality topsoil.
- 2.10.1.2.3 Measure B3 – Wetlands (Habitat) Creation: Frequently dredged material, both by plan and inadvertently, has been used to create wetlands and/or mixed wetland and upland habitats. This is particularly the case on the Great Lakes when filled or partially filled CDFs have not been used or maintained for many years and nature takes its course. Excellent examples exist at CDF 14 located in Cleveland, Ohio and Times Beach located in Buffalo, New York. In both cases, with relatively little human intervention, these areas have naturally vegetated and provide significant resting and feeding habitats for resident and migratory birds.
- 2.10.1.2.4 Measure B4 – Landfill Cover Using Dredged Material: Harvesting dry dredge material from the existing CDF for routine landfill cover could be a means of extending the useful life of the existing facility. A backhoe would excavate dry dredged material from the CDF and load dump trucks to transport sediment to nearby municipal solid waste landfills. At the landfills, the dump trucks would release the load; a bobcat or backhoe would place the material as cover where needed and a grader would smooth the sediment. Ideally, enough sediment would be excavated to maintain dredging approximately 150,000 cubic yards every other year.
- 2.10.1.2.5 Measure B5 – Brownfield Restoration: Brownfields are defined as environmentally impacted properties that have reuse or redevelopment potential for commercial, residential, recreation, and greenspace use. However, the presence or potential presence of pollutants, contaminants, and/or hazardous substances often deters prospective developers. In 1995 USEPA instituted the Brownfields Program designed to empower States, communities, and other stakeholders in economic redevelopment to work together to prevent, assess,

safely clean up, and sustainably reuse brownfields (USEPA, 2007). The primary objective of this program is to promote reuse and redevelopment of brownfields. In the process, many cumulative benefits are gained including introduction of new businesses, jobs, and community growth. Environmental restoration of contaminated lands preserves greenspace, wetlands, and other ecologically sustainable areas that may have otherwise been used for commercial development.

- 2.10.1.3 Measure C – Open-Lake Placement: A designated 960 acre open-lake placement site is located 3.5 miles northwest (N10°W) of the West Breakwater Light (Figure 2.1). Historically, USACE has utilized only the southerly two-thirds (640 acres) of the site. This site has not been used since 1977 (prior to construction of the CDF) because between 1977 and 2005 sediment failed Federal and State guidelines for open-lake placement.
- 2.10.1.4 Measure D – New Confined Disposal Facility (CDF): A new CDF could be designed and constructed. For this study, several possible locations were evaluated. A potential Outer Harbor location, north of the breakwater is shown in Figure 2.2.
- 2.10.1.5 Measure E – Management of the Existing Confined Disposal Facility to Extend Its Useful Life: Dry sediment is harvested from the existing CDF and removed to another location, keeping the CDF facility open. The area where sediment was harvested is now available for further disposal of dredged material. Sediment can also be used to raise the perimeter berm by grading it to a specific slope and elevation to maximize design capacity. Trenches are dug to dewater the sediment more quickly and maximize sediment compaction.
- 2.10.1.6 Measure F – Best Management Practices: Best Management Practices (BMPs) for reducing erosion and sedimentation in the Black River Watershed have also been considered in this study. BMPs include, but are not limited to, watershed actions such as conservation tillage, no-till farming, conservation cover crops, conservation cropping sequence, critical area planting, filter strips, grassed waterway, streambank protection, and use of sediment traps. Although all of these methods will reduce soil erosion and sedimentation in the river, certain controls appear to have more potential for reducing large quantities of sediment than others. These include: no till farming; zoning along streambanks to reduce erosion (e.g. buffer strips), and the use of upstream sediment traps.
- 2.10.1.7 Measure G (Aquatic Ecosystem Restoration): Aquatic ecosystem restoration projects include restoration and protection of aquatic habitat and water quality in lakes, rivers, and streams. The goal of aquatic ecosystem restoration is to restore degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural condition. Restoration activities can be accomplished through structural and non-structural actions including dredging sediment from

Figure 2.1 Open-lake Placement Site, Lorain Harbor, Ohio

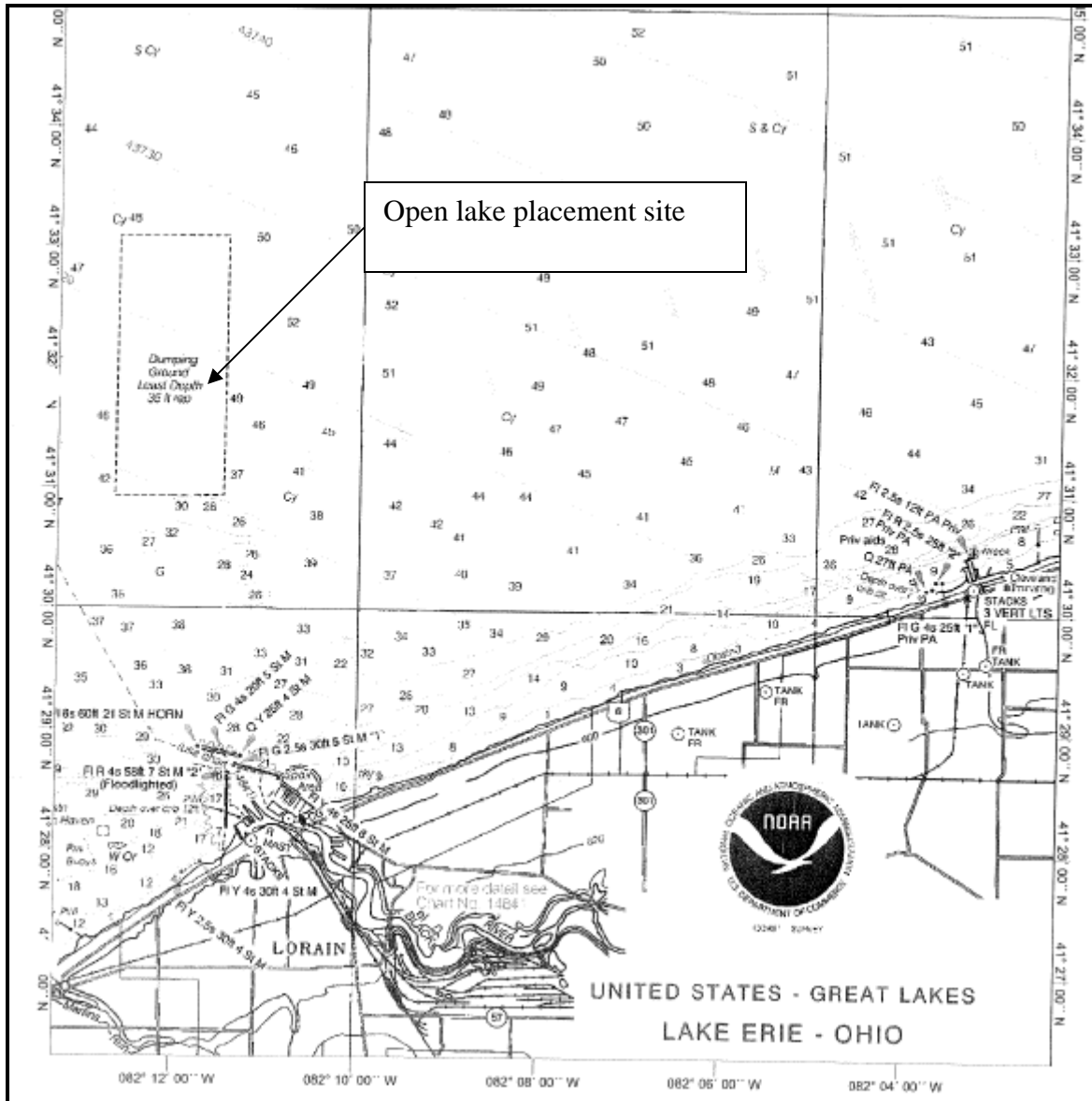
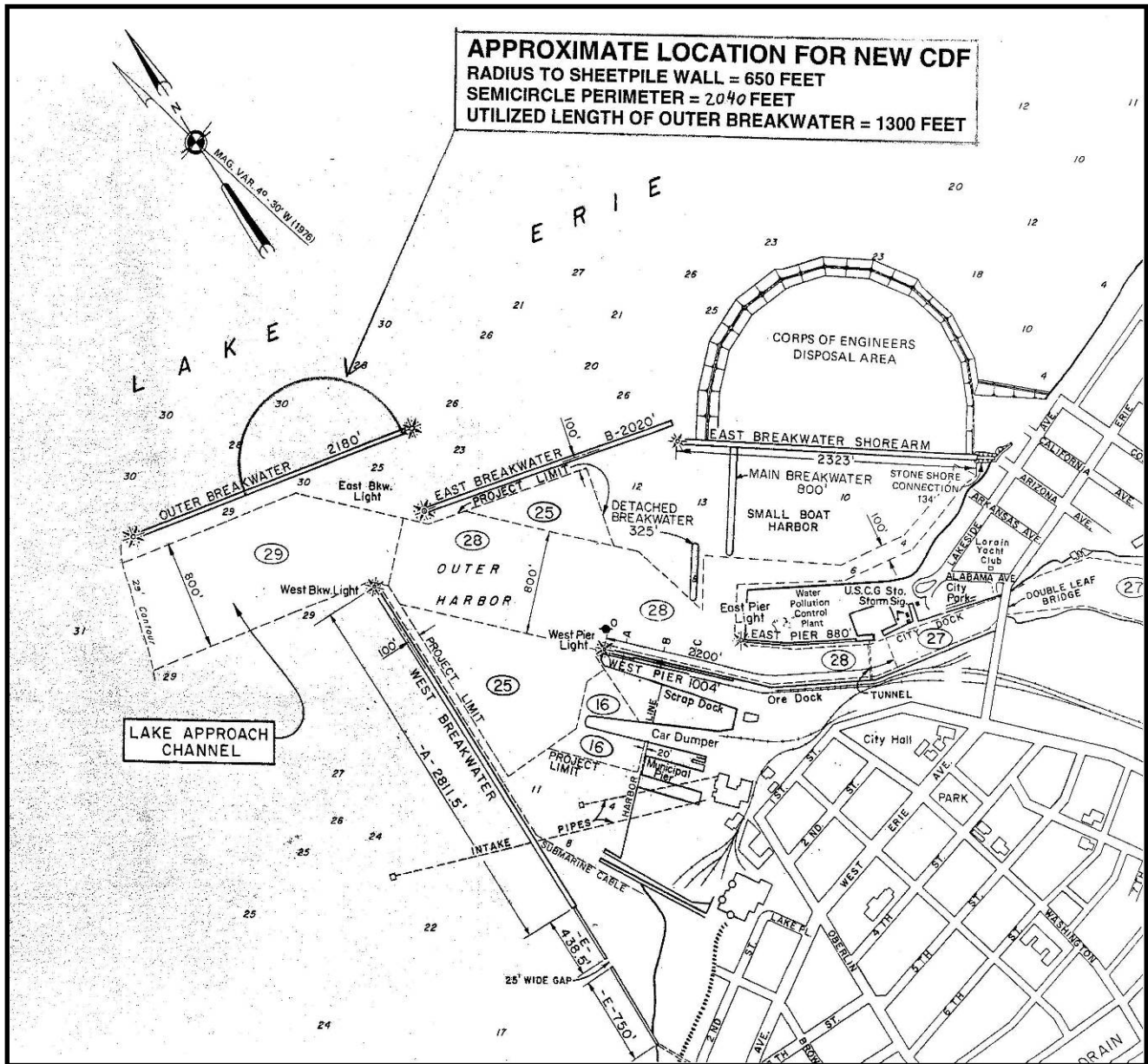


Figure 2.2 Proposed CDF Location



certain areas and creating spawning beds and habitat with the dredged sediment in other needed areas.

- 2.10.1.8 Measure H – Using Nearby CDFs at Other Federal Harbors (Huron, Ohio): Huron Harbor is located approximately 25 miles west of Lorain Harbor along the Lake Erie shoreline. In 1975, a CDF of 2,600,000 cubic yard capacity was constructed at the harbor. Currently, it is filled to about 75 percent capacity and is no longer used to dispose dredged material from Huron Harbor. Based on that estimate, the Huron Harbor CDF would have about 650,000 cubic yards of capacity left, the equivalent of four dredging cycles from Lorain Harbor. It is possible that dredged material, either dewatered from the Lorain Harbor CDF or freshly dredged, could be transported for confinement.
- 2.10.1.9 Measure I - Treatment Technologies: Treatment technologies are available to destroy, extract, or immobilize contaminants contained within harbor sediments. Most of these technologies are still in the development stages and only a few have been used in a limited number of sediment remediation projects throughout the Great Lakes. Most developed technologies require sediments to be dredged, placed in a storage area, and dewatered prior to treatment.

2.11 PRELIMINARY SCREENING OF MANAGEMENT MEASURES

2.11.1 Step 4 – Evaluating Alternative Plans - Comparing Measures to Objectives – Table 2.1 provides a preliminary evaluation of the dredged material placement Management Measures described above to the Specific Study Objectives (Section 2.7.2) developed for this DMMP. The following paragraphs further evaluate the measures and make a determination of what measures will be carried into detailed planning.

2.11.1.1 Measure A - No Action (Carried to Detailed Planning) - Under this measure, the Federal Government would do nothing to address the need for future long-term placement of dredged material. Dredging of the Federal navigation channels at Lorain Harbor would cease in 2009. (Note: the No Action plan is essentially the Without Project Condition). Without dredging, the navigation channels would progressively shoal in and impede commercial navigation. Deep-draft commercial navigation vessels would be light loaded over the 20-year evaluation period. Significant savings would be realized in the Federal budget as expenditures for operating and maintaining the Federal navigation project at Lorain Harbor would no longer be required. Consistent with USACE guidance (ER 1105-2-100), this measure will be carried forward into detailed planning and fully evaluated in the array of final alternative plans.

Table 2.1 – Preliminary Evaluation of Management Measures

Specific Study Objectives	Management Measures								
	No Action (A)	Beneficial Use (B)**	Open-lake Placement (C)	New CDF (D)	Mgt of Existing CDF – Berm-raising (E)	Watershed BMPs– Reduce Sediment Load (F)	Aquatic Ecosystem Restoration (G)	Use Huron CDF (H)	New Treatment Technologies (I)*
Maintains Federal channel for 20+ yrs	No	Yes	Yes, but only uncontaminated material	Yes	No	No, results would not be apparent until 10+ yrs after implementation	No	No, insufficient capacity	No
Maximize use of existing CDF	No	n/a	n/a	n/a	Yes	n/a	No	No, insufficient capacity	--
New CDF with 20-year capacity	n/a	n/a	n/a	Yes	n/a	Yes	No	n/a	--
Consistent with City Master Plan	Yes	Yes	Partially, only for uncontaminated material	Yes	Yes, but delays start of implementation until 2014	n/a	n/a	Yes	--
Minimizes relocation and disturbance to public/private entities	Yes	Yes	Yes	Yes	Yes	No, some BMPs could affect marina operations	Unknown	Yes	--
Short-term placement solution (2009-2013)	No	Potentially.	Yes, but only suitable material	No	Yes	No	No, too small amt of material used	Yes	--
Long-term placement solution (2014 -2028)	No	Yes, but only after 2013	Yes, but only unsuitable material	Yes	No	No	No	No	--
Minimize effects to aquatic habitat	Yes	Yes	No	No	Yes	Yes, in the long term	Yes	No	--
Minimize construction costs and O&M	Yes	Yes	Yes	No	No	No, BMPs might involve high costs due to construction of CSOs	No	No, due high transportation costs	--

Specific Study Objectives	Table 2.1 – Preliminary Evaluation of Management Measures								
	Management Measures								
	No Action (A)	Beneficial Use – Upland Site (B)**	Open-lake Placement (C)	New CDF (D)	Mgt of Existing CDF – Berm-raising (E)	Watershed BMPs– Reduce Sediment Load (F)	Aquatic Ecosystem Restoration (G)	Use Huron CDF (H)	New Treatment Technologies (I)*
Minimize physical impacts to City of Lorain	Yes	Unknown	Yes	Yes	No	No	n/a	Unknown	--
Avoid impacts to sewers	Yes	Yes	Yes	Yes, depends on location of new CDF	Yes, depends on design	Yes	Depends on design	n/a	--

*Due to the extremely high cost of treatment technologies and the minimal level of contamination in the Lorain Harbor channel bottom sediments, this measure was not evaluated against all the study objectives.

**Beneficial Use (B) currently quantifies impacts only to the Brownfield restoration measure, which will be carried to detailed planning; other beneficial use measures are not viable.

2.11.1.2 Measure B - Beneficial Use - Beneficial use of dredged material includes recreation, agricultural and habitat development, beach nourishment, industrial uses, and innovative engineering alternatives such as manufacture of soils from dredged material. Consolidated dredged material could be mined from the existing Lorain Harbor CDF and used elsewhere for beneficial purposes, or material freshly dredged could be dewatered and used for beneficial purposes. In either event, the need for future CDFs could be minimized. In order to successfully implement beneficial uses, the alternatives must be technically and economically feasible, obtain public support, and comply with all applicable Federal and State regulatory requirements.

2.11.1.2.1 Measure B1 – Littoral Nourishment (Not Carried to Detailed Planning) - ODNR and OEPA have developed guidelines for the use of dredged material for littoral nourishment. These guidelines require that the material contain at least 60 percent coarse-grain sediment and have a Total Organic Carbon (TOC) content of less than 5,000 parts per million (ppm). Sediment from the Black River Channel contains approximately 84 to 98 percent silts and clay and therefore do not comply with the State's 60 percent benchmark. In addition, the TOC level in river sediments, ranges from 26,600 to 36,100 ppm, and exceeds State benchmark values (see sediment analysis in Chapter 3, paragraphs 3.12 to 3.13.10). The sediments dredged from the Black River fail the State's two main criteria for nearshore and onshore nourishment and therefore are considered unsuitable for littoral nourishment.

2.11.1.2.2 Measure B2 – Soil Manufacture (Not Carried to Detailed Planning) – One conceptual measure is to use previously dredged sediments found in the existing CDF to make manufactured topsoil. Sediment currently in the existing CDF would be removed and used as a raw material input in a production process that would result in manufactured topsoil. The space created by removal of sediment from the CDF would be used to accommodate future dredged material disposal storage needs. Depending on the dredged material sediment type, manufactured topsoil can be created that has engineering, agricultural, and environmental uses (Table 2.2). This topsoil can be used in landscaping, parks, athletic fields, golf courses, wetland construction, landfill cover, Superfund restoration, brownfield restoration, and mine restoration.

In general manufactured soil is a blended combination of dredged material, available cellulose and bio-solids using the patented formulation of Recycled Soil Manufacturing Technology (RSMT). Manufactured soil has the following mixture components: 60 to 80 percent dredged material, 10 to 30 percent organic waste material (cellulose, sawdust, yard waste), and 10 percent reconditioned bio-solids (from sewage sludge).

Creating manufactured soil using dredged material from CDFs has been demonstrated as a feasible alternative as recently as 2002 in Mobile, Alabama. Dredged material from CDFs in Mobile, Alabama was used to make a manufactured soil, which was used as cap, and cover for a 75 acre nearby landfill. Over 250,000 cy of manufactured soil was used in the project. The Environmental Laboratory at the U.S. Army Engineer Research and Development Center (ERDC) performed manufactured soil screening tests on dredged material from CDFs in Mobile, Alabama. ERDC worked in conjunction with two national companies, one that provided bio-solids from reconditioned sewage sludge (N-Viro International) and the other provided RSMT.

Table 2.2 Beneficial Use Options

Beneficial Use Options	Dredged Material Sediment Type				
	Rock	Gravel & Sand	Consolidated Clay	Silt/Soft Clay	Mixture
Engineered Uses					
Land creation	x	x	x	x	x
Land improvement	x	x	x	x	x
Berm creation	x	x	x		x
Shore protection	x	x	x		
Replacement fill	x	x			x
Beach nourishment		x			
Capping		x	x		x
Agricultural/Product Uses					
Construction materials	x	x	x	x	x
Aquaculture			x	x	x
Topsoil				x	x
Environmental Enhancements					
Wildlife habitats	x	x	x	x	x
Fisheries improvement	x	x	x	x	x
Wetland restoration			x	x	x

Optimal blends for manufactured soils depend on the physical and chemical characteristics of the dredged material as well as the types and amounts of cellulose and bio-solids locally available. The production process associated with creating manufactured soil results in some production parameters that help maintain reduced costs and allows quality control of the products final characteristics. Since the majority of the manufactured soil is dredged material, input blending located at the source of the dredged material reduces production costs, eliminates double handling, and allows quality control measures to be put in place. A guaranteed source of additive material and a fixed yearly demand for the final product is needed to make the creation of manufactured soil economically viable.

At Lorain Harbor, the blending site would be located on or adjacent to the existing CDF. This would allow additives to be brought to the site, mixed, and harvested in one location. Soil components could be stockpiled, checked for quality, and moved by front-end loaders. The final product could then be transported by truck to its end user(s). A number of factors would affect the viability of this measure at Lorain Harbor including location of the blending facility, availability of other soil components, identification of end user(s), and the amount of truck traffic generated by this manufacturing process.

In order to access the CDF, all vehicular traffic would have to enter and exit a parking lot designated for use by a lakefront restaurant and marina, and travel through a residential community. This would pose safety concerns for recreation users of the marina, patrons of the restaurant, and residents of the community.

Secondly, organic waste materials and bio-solid additives need to be available for blending with the dredged material. The manufacturing process will have to use at least 75,000 cubic yards of dredged material per year, to equal the amount of cubic yards dredged biennially from Lorain Harbor. Assuming the dredged material accounts for 70 percent of the manufactured soil, at least 32,100 cubic yards of additives would be needed each year. A reliable source for these additives has not been identified. Assuming delivery in a 10 cubic yard dump truck, this would result in 3,210 truck movements through the residential neighborhood in a given year.

Another key ingredient in the success of manufactured soil is identification of an end user who will be able to use 107,100 cubic yards of manufactured soil per year for a 15 year period. Although there are a number of potential applications for manufactured soil, no end user has been identified that would need over one million cubic yards of manufactured soil for the period 2014 to 2028.

Finally, this manufacturing process will generate a large amount of truck traffic. Using 10 cubic yard dump trucks, approximately 3,210 truck movements would be needed just to bring the additives into the production site. Delivery of the manufactured soil to the final end user would require another 10,710 truck movements per year. This amount of truck traffic would tax the road system of the residential community, parking area of the marina and restaurant, and create significant safety concerns for residents, recreation users, and patrons of the adjacent businesses.

Given the above limitations associated with producing a manufactured soil adjacent to the existing USACE CDF at Lorain Harbor, this measure will not be carried forward to detailed planning. Implementation of a much smaller sized operation, or a one time removal of dredged sediment from the CDF, could be an option in the future to provide capacity for a year or two, but does not appear to be a viable method of providing dredged material disposal storage needs for Lorain Harbor from 2014 to 2028.

2.11.1.2.3 Measure B3 – Wetlands/Habitat Creation (Not Carried to Detailed Planning) -

As previously discussed the concept of creating wetland and/or mixed wetland and upland habitats using dredged material has been successfully implemented in numerous cases on the Great Lakes. Both non-contaminated and lightly contaminated dredged material has been used to create wetland/upland habitats. Due to the intense storm and wave action on the Great Lakes, such habitats are often created in protected areas, particularly within stone armored CDFs.

Several factors including the relative contamination of the dredged material led to the conclusion that construction of permanent wetlands using dredged material in the Lorain area is not a practicable measure, unless a protective CDF is also constructed. Virtually all historical wetlands of any substantial size that existed in Lorain have been destroyed by the urbanization, commercialization, and industrialization of the city environment. Small isolated wetland pockets may still exist along the Black River but any substantial increase in size of these wetlands would be limited by the physical characteristics of the river. Along the lakeshore, particularly outside of Lorain Harbor proper, sufficient space exists to build large wetland areas, but due to the high energy environment and possibility of wave attack, wetlands could not be constructed, unless they were protected by substantial rock dikes (essentially construction of a CDF to take the dredged material to construct a wetland).

The idea of wetland creation using dredged material, as an independent measure, has not been carried into detailed planning based on the discussion above. However, the idea of constructing a specific confined disposal area where the ultimate end use might be for a wildlife area with mixed areas of wetland and upland uses will be considered in evaluation of CDF configurations and designs.

2.11.1.2.4 Measure B4 – Landfill Cover (Not Carried to Detailed Planning) – As of 2008, there is only one solid waste municipal landfill in Lorain County, BFI Lorain County Landfill, located approximately 15 miles from the CDF. Of the five surrounding counties (Ashland, Cuyahoga, Erie, Huron, and Medina), only two (Cuyahoga and Erie) have a municipal solid waste landfill. The City of Brooklyn Landfill, located in Cuyahoga County, only accepts material (including fill) from City of Brooklyn residents. The distance of the Erie County Landfill from the Lorain Harbor CDF is approximately 30 miles.

To maintain the estimated yearly dredging quantities at Lorain Harbor, approximately 75,000 cubic yards of material would have to be excavated annually from the existing CDF and transported to landfills for use as landfill cover. Standard dump truck capacity is 10 cubic yards which would result in 7,500 truck loads of material to be transported via City streets in a given year, equating to approximately 28 trucks per weekday each year. The cost to load and unload one dump truck is estimated at \$3.65 per cubic yard. This cost includes additional labor and equipment necessary to assist and support the backhoe in excavation operations. The cost to load 75,000 cubic yards of sediment from a CDF and unload that sediment at a landfill is \$7.30 per cubic yard or \$547,500 per year. This cost does not include cost of the dump trucks and operators, mobilization and demobilization of equipment, haul road maintenance, mats to protect project surfaces, or costs associated with the transit of 7,500 trucks traveling 23 miles. The current average cost associated with dredging and disposal practices at Lorain Harbor is approximately \$5.03 per cubic yard. The measure of landfill cover has been eliminated from detailed planning primarily due to the costs associated with transport and disposal as well as the extreme impact of truck traffic movement through the residential community of Lorain to implement this measure.

2.11.1.2.5 Measure B5 – Brownfields Restoration – In recent years, USACE has conducted several beneficial use studies and environmental assessments to determine the feasibility of restoring brownfields with dredged material. In November 2004, USACE conducted an Environmental Site Assessment (ESA) at four brownfields located along the Black River (Figure 2.3). The ESA was performed in accordance with provisions found in American Society for Testing Materials (ASTM) E1527-00 *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. (USACE, 19 Nov 2004). The four brownfield sites listed below are discussed in further detail:

- a) RT-1 (Stein, Inc.)
- b) RT-2 (Coke Plant)
- c) RT-3 (North Fill)
- d) Burrell Homestead/East Fill site

Figure 2.3 Proposed Brownfields Restoration Locations



2.11.1.2.5(a) RT-1 Location (Stein, Inc.) (Not Carried to Detailed Planning) - The property is located at 1807 East 28th Street in Lorain, Ohio. It occupies approximately 3.2 acres with a nearby 5,000 square-foot building and parking lot. The building and parking lot are south of the potential beneficial use area. The property is bounded by the Baltimore & Ohio Railroad to the west and south and the Black River to the north and east.

The property is located in the northeast quarter of the Lorain Quadrangle on an upland plateau separated from the Black River floodplain by a steep 40 to 50 foot bank. According to the USGS topographic map, the property is at an elevation of approximately 620 feet above mean sea level. A broad 5 to 10 foot deep depression occupies the center of the property. Surface water drainage follows topography and flows north into the depression, where it then discharges to the Black River via a northeast gully. The property is too small to have a 15-year capacity for dredged material and is not consistent with the City of Lorain's Master Plan for brownfields redevelopment. Therefore this alternative is not carried to detailed planning.

2.11.1.2.5(b) RT-2 Location (Coke Plant) (Carried to Detailed Planning) - RT-2 is a 130-acre site located above the left bank of the Black River on the turning basin at the upstream end of the Federal channel. The property is the former site of a Republic Technologies International (RTI) coke plant and has been designated for brownfield redevelopment. The RT-2 property is bounded by a railroad spur to the south and west, a drainage course to the east, and Black River to the north. The Black River is deeply incised in this area, flowing in a narrow, gorge-like valley. The valley walls are relatively steep and bedrock is exposed in many places. The majority of the RT-2 site is elevated approximately 50 feet above the river.

There is some remnant riparian corridor along the Black River, and a locally significant great blue heron rookery is located on adjacent property on the river at the west end of the site. These areas provide nesting and breeding grounds for birds that inhabit the area, and are separated from the industrialized area of the site by a former railroad right-of-way that runs along the river at the top of the valley bluffs. In order to avoid potential adverse project impacts on these areas, placement of dredged sediment would be limited to the area south of the former railroad right-of-way. The fill area would also be set back from the drainage course located to the east, and a 20 foot setback has been assumed along the south and west property line. The 130-acre site is a viable location with at least 15 years of dredged material placement capacity. It is also consistent with the City of Lorain's Master Plan for brownfields redevelopment. This measure will be carried to detailed planning.

2.11.1.2.5(c) RT-3 Location (North Fill) (Not Carried to Detailed Planning) - The property is located at 1807 East 28th Street in Lorain, Ohio. It occupies approximately 3.3 acres on the lower floodplain of the Black River, at the foot of an escarpment. The property is bounded by the Lake Terminal rail complex to the south and the remainder of the perimeter by the Black River.

The property is located in the northeast quarter of the Lorain Quadrangle and northwest corner of the Avon Quadrangle. The property is on the Black River floodplain and bounded to the south by a steep 70 to 100 foot bank. According to the USGS topographic map, the property is at an elevation of approximately 575 feet above mean sea level. A small pond occupies about 0.4

acres in the center of the property and drains westerly to the Black River. Two possible impoundments totaling one acre exist in the eastern half of the property between the River and steep bank. Surface water drainage follows topography and flows to the north toward the Black River via overland flow.

RT-3 is located approximately 1.5 miles north of the upper limits of the Federal navigation channel. Placement of dredged material on the RT-3 brownfields would require hydraulic pumping of sediment between 1.5 and 5 miles upriver, followed by transport up a 70 to 100 foot bank. The cost to hydraulically pump this distance is high and the feasibility of equipment to pump sediment up the riverbank is unknown at this time. Another means to accomplish placement at this location is to truck sediment via city streets. Standard dump truck capacity is 10 cubic yards, which would result in 15,000 truck loads of material to be transported in a given year, equating to approximately 56 trucks per weekday in a given year. The cost to load and unload one dump truck is estimated at \$3.65 per cubic yard. This cost includes additional labor and equipment necessary to assist and support the backhoe in excavation operations. The cost to load 150,000 cubic yards of sediment from a CDF and unload that sediment at the brownfields is \$7.30 per cubic yard or \$1,095,000. This cost does not include cost of the dump trucks and operators, mobilization and demobilization of equipment, haul road maintenance, mats to protect project surfaces, costs associated with the transit of 15,000 trucks. In addition, RT-3 is too small to hold the necessary 15-year capacity of dredged material and is not consistent with the City of Lorain's Master Plan for brownfields redevelopment. Therefore this alternative will not be carried to detailed planning.

2.11.1.2.5(d) Burrell Homestead Location (East Fill) (Not Carried to Detailed Planning)-

The property is located at 1807 East 28th Street in Lorain, Ohio. It occupies approximately seven acres with two 700 square-foot buildings and a small parking area. The building and parking lot are in the western portion of the property. The property is bounded by East River Road (Route 301) on the east, the Norfolk and Western Railroad to the south, undeveloped land to the north, and the Black River west. A literature review of adjacent properties did not identify any past or present activities which could adversely impact the environment.

The property, located in the northwest quarter of the Avon quadrangle, is on an upland plateau separated from the Black River floodplain by a steep 70 to 100 foot bank. According to the USGS topographic map, the property is at an elevation of approximately 610 feet above mean sea level. The topography throughout the property varies by about 25 feet because of stock piled materials including gravel. Surface water drainage tends to follow topography and flows to the west toward the Black River via a network of gullies.

Burrell Homestead is located 2 miles north of the upper limits of the Federal navigation channel. Placement of dredged material on the Burrell Homestead brownfields would require hydraulic pumping of sediment between 2 and 5 miles upriver, followed by transport up a 70 to 100 foot bank. The cost to hydraulically pump this distance is high and the feasibility of equipment to pump sediment up the riverbank is unknown at this time. Another means to accomplish placement at this location is to truck sediment via city streets. Standard dump truck capacity is 10 cubic yards which would result in 15,000 truck loads of material to be transported via City streets in a given year, equating to approximately 56 trucks per weekday in a given year. The

cost to load and unload one dump truck is estimated at \$3.65 per cubic yard. This cost includes additional labor and equipment necessary to assist and support the backhoe in excavation operations. The cost to load 150,000 cubic yards of sediment from a CDF and unload that sediment at the brownfields is \$7.30 per cubic yard or \$1,095,000. This cost does not include cost of the dump trucks and operators, mobilization and demobilization of equipment, haul road maintenance, mats to protect project surfaces, costs associated with the transit of 15,000 trucks. In addition, development of this brownfield is not consistent with the City of Lorain Master Plan. Therefore this alternative will not be carried to detailed planning.

2.11.1.2.6 Geology and Hydrogeology of Brownfields Measures – Each of the brownfield sites are underlain by a deep soil, classified by the USDA as “Miner.” The soil is a Class D, silty clay loam that is very poorly drained and considered hydric. The soil is wet most of the time and commonly has a high water table; ponding is prevalent. This soil grades into stratified, clay to silt clay, lacustrine and floodplain deposits associated with glacial Lake Erie predecessors and the Black River. These cohesive soils produce the stable high banks (approximately 50 feet) adjacent to the Black River. The exact thickness of the unconsolidated soil and floodplain deposits has not been determined; bedrock in this area commonly ranges between 500 and 600 feet in elevation. The underlying bedrock consists of the flat lying, upper Devonian Ohio Shale, which extends at least 200 feet below the Black River.

2.11.1.2.7 Groundwater Flow of Brownfields Measures - Shallow groundwater flow in the soil horizon is toward local topographic lows. Groundwater flow in the floodplain deposits is toward the river (north and east) due to the steep high banks that act as groundwater sinks. Regional groundwater flow in the deep sediments and bedrock is toward the river and lake.

2.11.1.2.8 Drinking Water Status of Area Adjacent to Brownfields Measures- Drinking water in this area is supplied by the local municipal system with Lake Erie as the primary source. The silty clay to clayey soils and underlying, low-permeability shale bedrock commonly does not produce viable quantities of potable groundwater or groundwater of high quality. The floodplain deposits underlying RT-2 and RT-3 likely have high organic carbon content and thus low quality groundwater with rotting organic material odors.

2.11.1.3 Measure C (Open-Lake Placement) (Carried to Detailed Planning) - A designated 960 acre open-lake placement site is located 3.5 miles northwest of the harbor’s West Breakwater Light at N10°W (Figure 2.1). Although the entire site encompasses 960 acres, only the southerly two-thirds (640 acres) of the site would be used for dredged material placement. In accordance with joint USEPA/USACE protocols, all of the Black River channel material between the river mouth to approximately 1,400 feet upstream of river mile 2 (Station 143+47) meets Federal guidelines for open-lake placement. Although OEPA could amend Section 401 Water Quality Guidelines within the study period to eliminate open-lake placement of dredged material, it is currently a viable measure and therefore, will be carried to detailed planning.

2.11.1.4 Measure D (Construction of a New CDF) (Carried to Detailed Planning) - This measure has been divided into two sub-measures: D1 (Inner Harbor or Lakeshore CDFs) and D2 (Outer Harbor or Offshore CDFs). Most CDFs involve the construction of robust dikes using quarry stone or other suitable materials to withstand Lake Erie wave action and storms, sized to

accommodate the anticipated level of dredge material disposal for the estimated project life. The construction of an in-water CDF adjacent to the shore and/or existing navigation structures has historically been proven implementable and successful.

2.11.1.4.1 Measure D1 – Inner Harbor (Lakeshore) CDF– There were three sites evaluated for an Inner Harbor CDF at Lorain Harbor:

- a) Vertical expansion of the existing CDF
- b) Horizontal expansion of the existing CDF footprint
- c) New construction immediately adjacent to the existing CDF

2.11.1.4.1 (a) Vertical Expansion (Not Carried to Detailed Planning) - The maximum number of berm raisings that can take place, resulting in a stable berm, is three 4-6 foot lifts which will provide additional storage capacity for approximately three dredging cycles (for a detailed description see Chapter 1, paragraph 1.8.5.1). Construction of additional perimeter walls greater than 12-18 feet would likely cause lateral displacement of the existing structure and result in failure. Therefore, vertical expansion beyond the three scheduled FMP lifts was not carried forward to detailed planning as a long-term solution.

2.11.1.4.1 (b) Horizontal Expansion (Not Carried to Detailed Planning) - Horizontal expansion of the existing CDF would conflict with current land use and have similar stability problems as identified above with vertical expansion. Spitzer Marina and a widely used public parking area for recreation visitors, patrons of the marina, and adjacent restaurant occupy the landward side of the facility. Horizontal expansion of the existing CDF lakeward, is considered “new construction” even though it would be adjacent to the existing CDF. For the reasons described above, horizontal expansion of the existing CDF was not carried forward to detailed planning.

2.11.1.4.1 (c) New Construction (Not Carried to Detailed Planning) - New construction immediately adjacent to the existing CDF would result in deep water construction and require that the new CDF buttress the existing CDF. The existing CDF walls would require extensive armoring to provide stability to withstand the lateral pressure exerted on the wall by sediment placement. Construction north and east of the current CDF facility would result in deepwater construction and require perimeter walls to be armored to withstand Lake Erie storm waves. A CDF located adjacent to the current facility would most likely impede easterly sediment transport. Southeasterly expansion of the existing CDF would conflict with current and anticipated recreational uses identified in the City’s CDF Master Plan. New construction adjacent to the existing CDF was not carried forward to detailed planning.

2.11.1.4.2 Measure D2 – Outer Harbor (Offshore) CDF (Carried to Detailed Planning) - For analysis purposes, the proposed CDF would be constructed in the Outer Harbor along the north side of the Outer Breakwater (Figure 2.2). Existing water depths at the site range from 20 to 28 feet (NAD 1983). Approximately 1,300 feet of the perimeter of the CDF would consist of the existing breakwater structure. The remaining 2,040 perimeter feet would be constructed using steel sheet pile, core, and fill material. Core material would likely consist of slag and

quarried gravel or stone. Rubble fill material would likely consist of less restrictive size and quality, and could include concrete rubble (Figure 2.4).

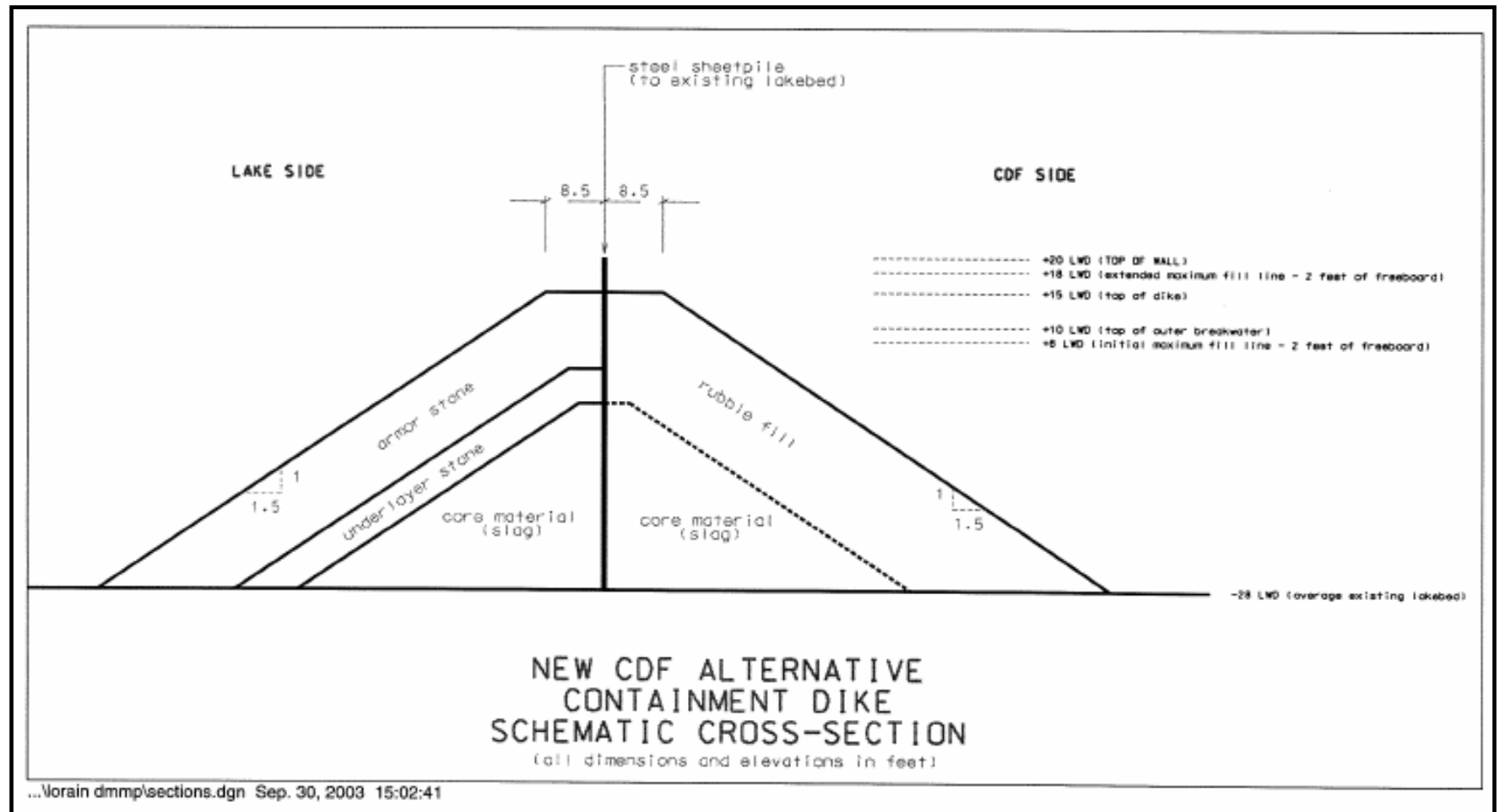
Construction of the CDF to a top elevation of +10 feet LWD, equal to the height of the Outer Breakwater, would provide an estimated capacity of 770,000 cubic yards. In order to obtain additional capacity totaling 1,000,000 cubic yards, the south perimeter of the CDF would be raised to an elevation of +20 feet LWD. Raising the CDF perimeter would provide an additional capacity of 230,000 cubic yards. The recommended construction alternative is installation of a cantilever sheet pile wall parallel, and immediately adjacent to, the north edge of the Outer Breakwater. The cantilever sheet pile wall would rely on the existing Outer Breakwater for lateral support and be less costly than a rubblemound perimeter. This measure will be carried forward for further planning and evaluation.

2.11.1.5 Measure E (Management of the Existing CDF to Extend Its Useful Life) (Carried to Detailed Planning) - The USACE, Buffalo District has constructed a number of CDFs in the past that have been filled or are essentially filled. A FMP, including various operational procedures such as grading, improved drainage, and vertical expansion (i.e. berm raising) can be employed to extend its useful life. Therefore, this measure will be carried forward to detailed planning. A detailed discussion of how Measure E will be implemented can be found in Chapter 1, Paragraph 1.8.5.1 of this report.

2.11.1.6 Measure F (Best Management Practices) (Not Carried to Detailed Planning) - For the purposes of the Lorain Harbor DMMP, BMPs would generally be designed to reduce sediment loads to the Black River watershed and eventually to the Federal navigation channels requiring maintenance dredging. The Black River, like many major rivers across the country, is being impacted by significant landscape alterations throughout the entire watershed, not just in the industrialized areas. These impacts are caused by the way the landscape is used for urban, suburban, and rural activities. Land disturbances associated with high residential growth rate and intensive agricultural practices are a particular problem. In the Black River watershed, there is an urgent need to better understand the Total Maximum Daily Loads (TMDLs) allowable throughout the watershed.

The downstream portion of the Black River watershed has been extensively used by industry and a considerable number of brownfields exist. Ideally, a buffer strip of natural vegetation (i.e., a riparian corridor of trees, shrubs, and grasses) along the river and streambanks would reduce erosion and runoff. Unfortunately, in many areas of the Black River watershed there has been considerable disruption of the natural riparian corridor. Without an intact vegetative buffer, significant amounts of non-point source pollution enter the Black River and its tributaries. The Black River watershed, encompassing 467 square kilometers in north-central Ohio, has been designated as an Area of Concern (AOC). The Black River is the only river system in Ohio where the entire watershed has been designated as an AOC. Great Lakes AOCs are severely degraded geographic areas within the Great Lakes Basin.

Figure 2.4 CDF Cross Section



The U.S.-Canada Great Lakes Water Quality Agreement (Annex 2 of the 1987 Protocol) defines AOCs as "geographic areas that fail to meet the general or specific objectives of the agreement where such failure has caused or is likely to cause impairment of beneficial use of the area's ability to support aquatic life." The Black River Remedial Action Plan Coordinating Committee together with OEPA is working together to address detrimental land use practices and the associated non-point source pollution.

Properly managing urban, suburban, and rural land use practices throughout the Black River, plus the enhancement and protection of natural riparian corridors, will improve the quality and productivity of this natural resource. Local entities and not the Federal government usually undertake BMPs. Any changes or improvements that result from BMPs would not be realized for at least 10 or more years from implementation. BMPs would be most effective on overland erosion and not bedload sediments. While a 516 (e) sediment transport model has been provided to OEPA by the USACE, it would be the responsibility of the local community to implement any program designed to reduce sediment loads. If various BMPs were implemented today by local entities within the watershed, the benefits of those measures would not be realized for years. Because these BMPs are outside the control of the USACE and have not yet been implemented by the community in any significant way, this measure will not be carried forward into detailed planning.

2.11.1.7 Measure G (Aquatic Ecosystem Restoration) (Not Carried to Detailed Planning) –

The restoration of riparian habitat along the Black River would benefit wildlife and improve the aesthetic quality of the area. It could provide a buffer between current industrial uses and various habitats including the great blue heron rookery located adjacent to the river and RT-2. The great blue heron is a species that is regularly monitored by ODNR, Division of Wildlife for its movements and survival rates. While a variety of projects could be constructed along the Black River, remediation of this river must be accomplished in stages. The RAP is currently focused on two missions: properly managing urban, suburban, and rural land use practices along the Black River through protection of the riparian corridor to improve the overall quality and productivity of the river, and develop sub-watershed habitat surveys to identify aquatic species and populations currently present in the river. Once land use practices are properly managed and maintained, and surveys tabulated, the RAP can begin to promote and aid the survival of aquatic species in the Black River watershed. Although dredged material could be used for habitat restoration within the Black River, it is likely that such projects would not occur for several more years. In addition, the quantity of material that would be utilized would be insignificant compared to the need to dredge 150,000 cubic yards of sediment every other year. Therefore, this measure will not be carried forward for further planning and evaluation.

2.11.1.8 Measure H (Using Nearby CDFs at Other Federal Harbors [Huron, Ohio]) (Not Carried to Detailed Planning) -

Huron Harbor is located approximately 25 miles west of Lorain along the Lake Erie shoreline. In 1975, USACE constructed a CDF (2,600,000 cubic yard capacity) at the harbor. Currently, the CDF is filled to about 75 percent capacity and has a remaining capacity of approximately 650,000 cubic yards. This would provide CDF storage for approximately two to four dredging events from Lorain Harbor. While it is technically feasible that dredged material could be transported from Lorain to Huron for placement, transportation costs would be prohibitive. Although not estimated, the cost of transporting dredged material in

1,000 to 1,500 cubic yard scows, pushed by tugs 25 miles each way from Lorain to Huron would be extremely high. Lastly, sediments currently dredged at Huron Harbor are not contaminated and are placed in a designated open lake site in Lake Erie. This is a recent change from historical practices when Huron Harbor sediments were considered contaminated and placed in the CDF. The existing space in Huron Harbor CDF provides a safety valve for commercial navigation at Huron Harbor if for some reason Huron Harbor sediments fail Federal guidelines for open-lake placement and require containment in a CDF. For these reasons Measure H was not carried to detailed planning.

2.11.1.9 Measure I (Treatment Technologies) (Not Carried to Detailed Planning) - The concept of treating, or decontamination of contaminated dredged material as it is dredged, and using the byproduct as fill material or manufactured soil has been investigated on small pilot programs in the past and is currently being evaluated on a larger scale field demonstration at the Ports of New York and New Jersey (Jones, K.W. et al., undated manuscript). Possible treatment technologies range widely from adding compost and manure to the dredged material; solidification of the dredged material by adding cement, fly ash, and other products; chemically washing the dredged material; and thermal destruction of contaminants. Due to the relatively small scale treatment technology experiments to date, and the often high cost of treatment technologies, costs per cubic yard of dredged material can often exceed \$100. In practice, when treatment technologies are applied, they are used to decontaminate small quantities of highly contaminated HTRW material. No known large-scale, economical production to treat dredged material has been achieved to date but research is ongoing. For such reasons, treatment technologies (except where they might be an economical part of a larger mine reclamation alternative) have not been carried to detailed planning.

2.12 Step 5 – Comparing Alternative Plans - Alternative Plan Formulation -- The planning process developed a number of nine measures and several sub-measures that could be used to develop plans that address the need to dispose of dredged material removed from the Federal navigation channels for the next 20 years. Using these measures, the Lorain Harbor DMMP identified five measures that would be carried into detailed planning:

- Measure A- No Action
- Measure B5 – Brownfields Restoration-RT-2 (Coke Plant) Site
- Measure C -Open-Lake Placement
- Measure D2- Construction of an Outer Harbor CDF
- Measure E- Management of the Existing CDF to Extend Its Useful Life (FMP)

The five measures carried forward to detailed planning were used to develop a range of plans that would allow the harbor to be maintained over the 20-year evaluation period from 2009 to 2028. A total of four plans were formulated using a combination of the five measures. A summary of the four plans and their components is presented in Table 2.3 and described below.

Table 2.3 Alternative Plan Formulation

Alternative Plans	Management Measures				
	No Action (A)	Beneficial Use – Brownfields Restoration (B5)	Open-lake Placement (C)	New CDF (D2)	FMP at Existing CDF (E)
Plan 1 (Open-lake Placement, new CDF, FMP)			X	X	X
Plan 2 (Brownfields Restoration, FMP)		X			X
Plan 3 (Brownfields Restoration, Open-lake Placement, FMP)		X	X		X
Plan 4 (No Action)	X				

2.12.1 Alternative Plan 1- Open-lake Placement, Outer Harbor CDF, Fill Management

Plan - Plan 1 includes implementation of the FMP from 2009 through 2013, open lake placement of sediments dredged lakeward of river mile 2 (Station 143+47), and construction of an outer harbor CDF along the north side of the outer breakwater. Implementation of the FMP at the current CDF will allow sufficient time for planning and construction of the new CDF.

For cost analysis, the plan assumes sediment dredged from the lower 68 % of the Federal channel is suitable for open-lake placement. Costs associated with placing sediment in the open lake are approximately \$769,100 per dredging event (based on an estimated 102,000 cubic yards of sediment). Sediment dredged from the upper 32 percent of the Federal channel would be placed in the CDF. Costs associated with disposing the sediment at the outer harbor CDF are approximately \$510,000 per dredging event (based on an estimated 48,000 cubic yards of sediment). Total dredging costs per dredging event is \$1,279,100. Construction of the new CDF would take place in approximately 20 to 26 feet of water, constructed over a 3 year period (2011, 2012, 2013), provide approximately 1 million cubic yards of capacity and cost \$31.9 million. Plan implementation costs in current dollars are \$50,149,800. For planning purposes, the CDF capacity has been sized to accept all sediment dredged from the Federal channels from 2014-2028 in the event OEPA amends Section 401 Water Quality Guidelines within the study period to eliminate open-lake placement.

2.12.2 Alternative Plan 2- Brownfields Restoration and Fill Management Plan - Plan 2 includes implementation of the FMP from 2009 through 2013, and placement of all sediment dredged from 2014 to 2028 at RT-2, a 130 acre brownfield located south of the turning basin at the upstream limit of the Federal Channel. Implementation of the FMP at the current CDF will allow sufficient time for planning and preparation of the Brownfield by the City, for dredge material placement.

2.12.2.1 Suitability of Dredged Material for Brownfield Restoration - As one of the first steps in assessing the feasibility of using sediments dredged from the Black River and Lorain Harbor for beneficial use, the most recent dredged material data was screened against risk-based concentrations and environmental guidelines and standards. Results of this screening are presented in the “MEMORANDUM FOR FILE, Risk Based Screening of Dredged Material from Lorain River Channel and Outer Harbor for Potential Beneficial Use of Dredged Material, in Support of the Lorain Dredged Material Management Plan, CELRB-TD-EH, Karen Keil Ph.D., Environmental Toxicologist, February 2005” (which can be found in Appendix H). This memorandum concluded that the dredged material may be used as is, without cover, in applications where only people would be exposed to the dredged material, in either a recreational, park, or industrial setting. Furthermore, leaching of constituents from the dredged material to a potable groundwater aquifer, or to surface water, would most likely not result in unacceptable groundwater or surface water concentrations. There are a few constituents (such as PAHs) which are present at levels slightly exceeding either the USEPA or Ohio thresholds under a residential land use, however, they should not pose a problem under less restrictive land uses such as industrial or recreational.

2.12.2.2 Description of Proposed Filling Procedures - Placement of dredged material on the site would occur in phases and create three cells (Figure 2.5 and Table 2.4). The center cell would be filled first to be consistent with the City of Lorain’s schedule to relocate the Black River WWTP. After filling, this area of the site would be available for the City to begin construction of the WWTP.

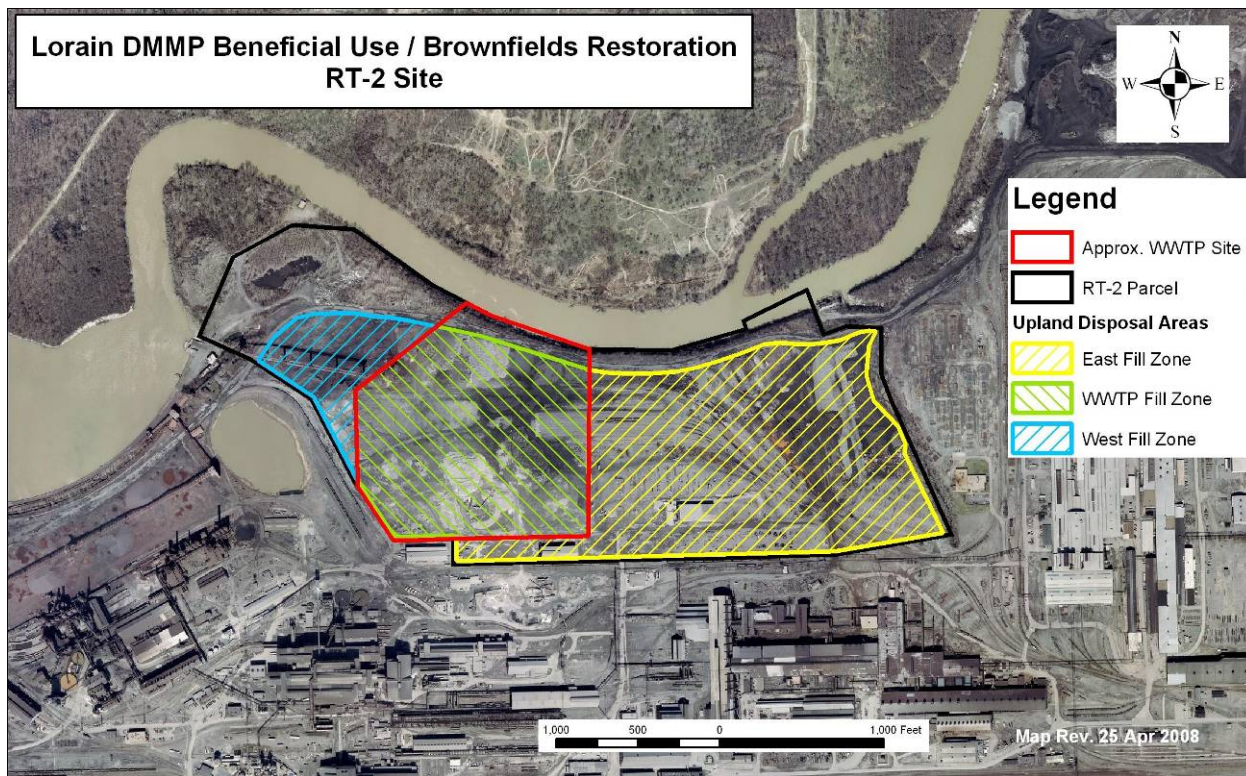


Figure 2.5 Proposed Filling Location

Table 2.4 – Site Filling Parameters				
Fill Zone	West	WWTP	East	Total Usable Area
Final Grade (ft)	631.2	631.2	631.2	631.2
Area (acres)	9.6	36.3	55.2	101.1*
Average Depth of Fill (ft)	9.0	7.5	7.8	7.8
Available Volume (cy)	117,696	320,328	613,757	1,051,826
Computed Site Life (Dredging Cycles)	.78	2.14	4.09	7.01
Assumed Final Site Life (Dredging Cycles)	1	2	4	7
*Placement of dredged sediment would be limited to the area south of the former railroad right-of-way. The fill area would also be set back from the drainage course located to the east, and a 20-foot setback has been assumed along the south and west property line. Of the total 130-acre site, 101.1 acres would be suitable for disposal.				

Existing grades in the fill zones are fairly uniform at about 622 feet, but significant stockpiles of material are located within this footprint. It has been assumed that this material will remain on site but that stockpiles will be graded to allow coverage with dredged material. Three-dimensional visualizations of the site before and after fill placement are provided in Figures 2.6 and 2.7.

Note that Table 2.4 shows computed fractional dredging cycles for the capacity of the fill areas. This is acceptable for the level of analysis performed for the DMMP. Footprints can be adjusted during detailed design to provide the dredging cycle capacities shown in the bottom row. This will not require major changes to the footprints since the computed values are all close to even numbers. Some area will need to be transferred from the WWTP Fill Area to the West Fill Area and likewise from the East Fill Area to the WWTP Fill Area. Data and parameters for fill placement used in this analysis are as follows:

- Provide sufficient volume for eight biennial dredging cycles of 150,000 cubic yards each.
- Assume a uniform final grade over all filled areas of the site.
- Assume 10 percent volume loss for any interior and perimeter berms required to contain the dredged material.
- Aerial photography, parcel, and topographic data from 2002 provided by the Lorain County Auditor's Office.
- Approximate WWTP footprint was taken from the *Black River WWTP Relocation Feasibility Study, Draft Report V-2, December 2006* prepared for the City of Lorain, OH by Malcolm Pirnie.

2.12.2.3 Method of Fill Placement - Several alternate methods were considered for placement of fill on the site. The choice method will be dictated by economics and environmental acceptability. Alternatives considered are provided below.

Figure 2.6 RT-2 Before Fill Placement



Figure 2.7 RT-2 After Fill Placement

2.12.2.3(a) Method 1 - Pump dredged material directly into unlined bermed cells on the site in the manner of a conventional CDF. Cell berms could be constructed with on-site slag materials. Trenches would be constructed to accelerate dewatering and consolidation of dredged material. Surface water would be retained, possibly in a single central holding area, for sufficient time to control total suspended solids (TSS) prior to any potential discharge to the Black River. A discharge standard of 100 ppm TSS for CDF effluent water has been accepted by OEPA in the past, but they are currently considering requiring a lower value.

This method would require transporting dredged material to the upstream limits of the Federal channel (by barge or pump), and then pumping it against a static head of approximately 60 feet to reach the top of the proposed fill elevation from the normal water surface of the Black River. This is technically feasible, but would increase the cost of dredging.

This method depends on the acceptability of allowing water to percolate freely from the bottom of the cells into site soils. Given the site history, known site environmental contamination, and the potential for undiscovered contamination, there is a possibility that percolated water might mobilize existing onsite contaminants. However, the City of Lorain is currently engaged in Phase 2 site investigation activities, and it is anticipated that “hot spots” would be identified prior to on-site fill placement. Furthermore, groundwater resources in this area are of low value and not widely utilized, there are no potable wells between the site and the river, and the use of an Urban Setting Request to restrict groundwater use has been recommended. In this context, this method may be found acceptable, and given its relatively low cost it will be carried forward into detailed planning.

2.12.2.3(b) Method 2 - Pump dredged material directly into bermed cells with a clay, geomembrane, or composite liner to prevent water from percolating out of the dredged material into site soils. This would likely require a drainage system to prevent water from ponding on top of the liner.

This is equivalent to Method 1 with the additional cost of the liner system. It has the benefit of eliminating the possibility that water released from the dredged material would mobilize existing onsite contaminants. However, due to its high cost this method will not be carried forward into detailed planning.

2.12.2.3(c) Method 3 - Pump dredged material into an on-site constructed dewatering facility, then excavate dry dredged material and place it on the site using conventional grading techniques. The dewatering facility would be designed as a CDF with capacity for a single dredging event. Since dredging occurs every other year at Lorain Harbor, there should be ample time to dewater and remove soil from this facility prior to the next dredging. Trenches would be constructed to accelerate dewatering and consolidation of the dredged material. Surface water would be ponded for sufficient time to control TSS prior to discharge to the Black River.

This method incurs the expense of constructing a dewatering facility, either on the RT-2 site (probably at the west end) or at some other convenient location. Additionally, it requires additional handling the dredged material since it must be excavated from a dewatering facility, trucked, and then placed and graded on site.

Since dredged material would be placed dry, this method eliminates the possibility that water released from the dredged material would mobilize existing onsite contaminants. Additionally, the dredged material layer would act as a barrier to precipitation moisture, reducing the volume of water that would otherwise flow through existing site soils potentially mobilizing contaminants. However, due to its high cost this alternative filling method will not be carried forward into detailed planning.

2.12.2.3(d) Method 4 - Utilize the existing Lorain Harbor CDF as a dewatering facility, operating it as described above under Method 3. This would provide a cost savings over Method 3 since it avoids the construction of a new dewatering facility. Some additional transportation costs would likely be incurred above those in Method 3, but the existing CDF is less than 4 miles from RT-2 so these costs would be relatively small. It might also be possible to mine existing dry, dredged material from the Lorain CDF and place it at RT-2. This would create additional capacity in the existing CDF, and the material would be available immediately upon demand.

It should be noted that Method 3 and Method 4 both provide the means to dispose of dredged material for a time period beyond the planning window of this study, dependent only on the availability of additional sites for placement of the excavated dredged material located within an economically feasible distance and upon the acceptability of maintaining dewatering facility operations. This method would require that a portion of the Lorain Harbor CDF, large enough to handle a single dredging event, be kept open and operated through 2028, which conflicts with the City's plans for future recreational use of the existing CDF. Therefore, this alternative filling method will not be carried to detailed planning.

2.12.2.4 Brownfield Restoration Viability - The 130 acre site is a viable location with a minimum 15 year capacity for placement of dredged material and this use is consistent with the City of Lorain's Master Plan for brownfields redevelopment. USACE assumes that placement of dredged material at this site would be compatible with proposed fill method 1.

Under Alternative Plan 2, all sediment removed during a dredging event would either be placed in the current CDF (2009-2013) or at the Brownfield Restoration site in accordance with proposed fill method 1 (2014 to 2028). Dredging costs per dredging event from 2009-2013 are estimated at \$1,434,500. Dredging costs per dredging event from 2014-2028 are estimated at \$1,523,600. For cost comparison purposes, if USACE were responsible for preparing RT-2 to accept dredge material, construction would take place over a 2 year period (2012-2013) and cost approximately \$6.4 million. Plan implementation costs in current dollars are \$24,494,300. However, the City of Lorain, the landowner, would be responsible for site preparation and obtaining any necessary State permits; the Federal government will incur no construction or permit costs.

2.12.3 Alternative Plan 3- Brownfields Restoration, Open-lake Placement And Fill

Management Plan - Plan 3 includes implementation of the FMP from 2009 through 2013, open-lake placement of sediments dredged lakeward of river mile 2 (Station 143+47), and placement of sediment dredged landward of river mile 2 from 2014 -2028 at RT-2, a 130 acre brownfield located south of the turning basin at the upstream limit of the Federal Channel. Implementation of the FMP at the current CDF will allow sufficient time for planning and preparation of the brownfield by the City, for dredge material placement.

RT-2 is the former site of RTI coke plant and has been designated for brownfield redevelopment. The 130-acre site is a viable location for developing a minimum 15-year capacity for dredged material and this use is consistent with the City of Lorain's Master Plan for brownfield redevelopment. The sediment removed during a dredging cycle that meets the Federal standard for open-lake placement, would be placed in the identified, existing open lake site. All other sediment would be placed either at the existing CDF or the brownfield restoration site. Costs associated with placing sediment in the open lake are approximately \$769,100 per dredging event (based on an estimated 102,000 cubic yards of sediment). Placement of sediment at the existing CDF (approximately 48,000 cubic yards per dredging cycle) is approximately \$510,000 per dredging event. Costs associated with placing the same quantity of sediments at the brownfield restoration site, in accordance with fill method 1 is \$538,500. Total dredging costs per dredging event during the 2009-2013 period is \$1,279,100. Total dredging costs per dredging event during the 2014-2028 period is \$1,307,600. For cost comparison purposes, if USACE were responsible for preparing RT-2 to accept dredge material, construction would take place over a 2 year period (2012-2013) and cost \$6.4 million. Plan implementation costs in current dollars are \$22,456,300. However, the City of Lorain, the landowner, would be responsible for site preparation and obtaining any necessary State permits; the Federal government will incur no construction or permit costs. The RT-2 site has the capacity to accept all sediment dredged from the Federal channels from 2014-2028 in the event that OEPA amends Section 401 Water Quality Guidelines within the study period to eliminate open-lake placement.

2.12.4 Alternative Plan 4 No Action – Under the No Action plan, all expenditures associated with dredging would cease in Project year 1 (2009). Future sediments deposited in commercial navigation channels from shoaling during the 20-year evaluation period (2009-2028) would not be dredged and would result in reduced channel depths for commercial vessels. Since dredging would cease in Project year 1, there would also be no Fill Management Plan costs during the project evaluation period.

2.13 BASE PLAN

2.13.1 Base Plan - Definition - In accordance with ER 1005-2-100, it is USACE policy to accomplish the placement of dredged material associated with the construction or maintenance dredging of navigation projects in the least costly manner. Dredged material placement is to be consistent with sound engineering practice and meet all Federal environmental standards including those established by Section 404 of the CWA of 1972, as amended. This constitutes the "Base" dredged material management plan for the navigation purpose. The Base Plan may or may not be ultimately selected for implementation, but it is important in terms of defining project impacts and cost-share requirements.

Costs associated with implementing each of these plans were developed, placed into a time line, and converted to an average annual cost (Table 2.5). Detailed information on the costs associated with the four plans is provided in Appendix G. The Base Plan is defined as the least cost, environmentally acceptable plan consistent with sound engineering practice. Total average annual costs in Table 2.5 identify Plan 3 as the same as the Base Plan.

Table 2.5 - Costs Associated with Alternative Plans 1-4 and the Base Plan

Investment Costs	Plan 1	Plan 2	Plan 3	Plan 4	Base Plan
Total Implementation Cost	\$50,149,840	\$24,494,300	\$22,456,336	\$0	\$22,456,336
Interest during construction ¹	\$0	\$0	\$0	\$0	\$0
Investment Cost	\$50,149,840	\$24,494,300	\$22,456,336	\$0	\$22,456,336
Average Annual Cost					
Present Worth of Investment Cost	\$38,292,300	\$16,710,900	\$15,488,700	\$0	\$15,488,700
Partial Payment Factor ²	0.07939	0.07939	0.07939	0.07939	0.07939
Average Annual Cost	\$3,040,200	\$1,326,800	\$1,229,700	\$0	\$1,229,700
Annual Maintenance Cost ³	\$159,500	\$32,100	\$32,100	\$0	\$32,100
Total Average Annual Cost	\$3,199,700	\$1,358,900	\$1,261,800	\$0	\$1,261,800

1. No computation of interest during construction since all project costs are incurred on or after the Base year, and average annual project benefits are being realized.

2. Partial payment factor is based on 20-year project life and a 4.875 percent annual interest rate.

3. Annual maintenance is 0.5 percent of Contractors earnings and contingencies.

2.13.2 Lorain Harbor Base Plan – The Base Plan has two components: implementation of a FMP from 2009 through 2013 at the existing CDF and disposal at an upland location (RT-2) that will accommodate dredging disposal needs through the end of the project evaluation period, 2028. The FMP will provide additional space at the current CDF through 2013. Upland disposal at the brownfield (RT-2) would provide capacity for a minimum 15 years, or eight dredging cycles. The plan assumes that 150,000 cubic yards of channel bottom sediments will be dredged and placed every other year. All sediment that meet Federal guidelines for open-lake placement will be placed in the open lake area and all sediment that fails Federal guidelines will be placed at RT-2 (Table 2.6). Appendix A provides a more detailed discussion of the Base Plan.

2.13.3 Best Operational Management Practices (BOMPs) to Accommodate Scheduled Federal Dredging - The Base Plan identifies the management practices that will be used to place dredged material from 2009 through 2028, including continued use of the existing CDF and placement at the RT-2 site. Periodic BOMPs will be implemented at the existing CDF to optimize capacity of the facility. These practices will include contouring sediment site and trenching to promote optimal dewatering. The management practices are discussed below.

Table 2.6 Biennial Dredging Quantities and Placement Locations

Channel Location	Percent of sediment dredged from channel reach in a given year	Percent of sediment dredged converted to quantities (based on 150K/cycle)	Placement Location Based on Sediment Suitability
Outer Harbor	20%	30,000 cubic yards	Open Lake
River Channel (lakeward of 143+47)	48%	72,000 cubic yards	Open Lake
River Channel (landward of 143+47)	32%	48,000 cubic yards	Brownfield (RT-2)
TOTAL	100%	150,000 cubic yards	

2.13.4 CDF Fill Management Plan (FMP) – The objective of the FMP is to maximize the capacity of the existing CDF. The FMP involves three phases to be implemented in 2007, 2009, and 2011. Each phase includes grading existing dredged material within the CDF to create 4-6 foot perimeter lifts (i.e. berms). The top elevation of the first, second, and third phases will be +17, +23, and +29 LWD, respectively. Each phase will provide additional capacity of approximately 150,000 cubic yards. A minimum 2 foot freeboard shall be maintained over the entire area. The first perimeter lift was completed in September 2007 to accommodate dredging scheduled for fiscal year 2008. Two more perimeter lifts are scheduled during the project evaluation period (2009-2028). These lifts will take place in 2009 and 2011 and provide space for sediments dredged in 2010 and 2012 that require placement in a CDF.

2.13.5 Dredging - Project Evaluation Years 2009 through 2013 – There are two dredging cycles scheduled during this time period: 2010 and 2012. It is anticipated that 150,000 cubic yards will be dredged during every dredging cycle. All sediment that meet Federal guidelines for open-lake placement will be placed in the open lake area and all sediment that fails Federal guidelines will be placed in the existing CDF.

2.13.6 Dredging - Project Evaluation Years 2014 through 2028 - The use of BOMPs at the existing CDF will provide approximately six years (2008 through 2014) for the City to plan, design, and develop the RT-2 site for sediment placement for the remaining eight dredging events (2014 through 2028).

2.14 Step 6 - Selecting a Plan – The screening process identified five measures that were carried to detailed planning. The measures include no action, beneficial use (brownfield restoration), open-lake placement, construction of a new CDF, and implementation of a FMP. These measures were determined to be economically viable, engineeringly feasible, and environmentally acceptable. Based on these measures, the four alternative plans (described in Chapter 2, Section 2.12) were developed. Economic evaluations of the plans are provided in Table 2.5 and discussed in detail in Appendix G. Cost analysis for construction of a new CDF and beneficial use of dredged material at RT-2 are in Appendix I.

2.14.1 Plan Evaluation – Table 2.5 provides implementation costs and average annual costs associated with each plan. Table 2.7 provides benefits, benefit to cost ratios, and net benefits of

each alternative plan. This information will be used, in part, to determine the tentatively selected plan.

Table 2.7 Plan Evaluation

Economic Parameters	Plan 1	Plan 2	Plan 3 ----- -Base Plan -NED Plan	Plan 4
WOP Average Annual Transportation Cost	\$15,802,700	\$15,802,700	\$15,802,700	\$15,802,700
WP Average Annual Transportation Cost	\$13,582,000	\$13,582,000	\$13,582,000	\$15,802,700
Benefits	\$2,220,700	\$2,220,700	\$2,220,700	\$0
Costs				
WP Average Annual Harbor Maintenance Cost	\$3,199,700	\$1,358,900	\$1,261,800	\$0
WOP Average Annual Harbor Maintenance Cost	\$0	\$0	\$0	\$0
Total Costs	\$3,199,700	\$1,358,900	\$1,261,800	\$0
Benefit Cost Ratio				
Average Annual Benefits	\$2,220,700	\$2,220,700	\$2,220,700	\$0
Average Annual Cost	\$3,199,700	\$1,358,900	\$1,261,800	\$0
Benefit to Cost Ratio	0.69	1.63	1.76	NA
Net Benefits	\$979,000	\$861,800	\$958,900	\$0

Benefits associated with the various plans are defined as the difference in average annual commercial navigation vessel transportation costs between the without project condition and the with project condition. The commercial vessel transportation cost increases avoided are the benefits associated with implementation of any plan that provides authorized channel depths over the 20-year project evaluation period. Commercial navigation vessel transportation costs calculated for the without and with project condition was based on 2005 tonnages, and includes the corresponding vessels and origin destination pairs used to move and source the tonnages.

Under without project condition, dredging is assumed to cease in 2009. Consequently commercial navigation channels begin to shoal in with sediment and cause a reduction in depth available to commercial vessels. The evaluation allowed channel depths to shoal to 21 feet LWD. The reduction in channel depth over time results in light loading commercial vessels that use Lorain Harbor. Assuming the same amount of tonnages move through the harbor each year over the 20-year evaluation period, more vessel trips are needed each year to move the same amount of tonnage.

Transportation costs were calculated for each year of the 20-year project evaluation period under the without project and with project condition. This transportation cost time stream was then converted to present worth values, and an average annual value using the current Federal discount rate of 4.875 percent and a 20-year project evaluation period. Table 2.7 provides the average annual vessel transportation costs under without project (\$15,802,700) and with project conditions (\$13,582,000). The net vessel transportation savings associated with any plan that provides currently maintained project depths over a 20-year evaluation period is \$2,220,700. Appendix G provides further information on the calculation of project benefits.

Costs associated with the various plans are defined as the difference in average annual harbor maintenance costs between with project condition and without project condition. Under without project condition, all harbor maintenance costs cease at the first year of the project evaluation period. Consequently, net plan costs are the costs associated with implementing the various alternative plans.

All costs associated with implementing the various plans were placed into a time line over the 20-year project evaluation period. Plan costs included costs associated with dredging, implementing the FMP, new disposal site implementation costs (real estate, engineering and design, plans and specs, construction costs where applicable, etc.), as well as a range of “other periodic” recurring costs (channel soundings, environmental studies, economic studies, sediment sampling, etc). Plan costs were developed for each year of the 20-year project evaluation period for each plan under with project conditions. This time stream of plan costs was then converted to present worth values, and an average annual value using the current Federal discount rate of 4.875 percent and a 20-year project evaluation period. Table 2.5 provides the average annual costs associated with implementing the various alternative plans. Plan average annual costs range from \$1,261,800 for Plan 3 to \$3,199,700 for Plan 1. Appendix G provides further information on the calculation of plan costs.

2.14.2 Tentatively Selected Plan – Based on the information above:

- Alternative Plan 1 has a benefit to cost ratio less than 1 and therefore is not economically viable.
- Alternative Plan 2 may not provide adequate capacity for the 20-year project evaluation period. RT-2 has as estimated capacity seven dredging cycles and USACE requires a facility with a capacity of eight dredging cycles.
- Alternative Plan 3 is the NED plan since it has the highest net benefits
- Alternative Plan 4, the No Action Plan, has no net benefits and no net costs. However, the No Action Plan does not provide any facilities to place sediments and therefore does not meet the major goal of providing sediment storage facilities for a 20-year evaluation period.

Alternative Plan 3 is the tentatively selected plan, because it provides adequate capacity for the project evaluation period, using a combination of open-lake placement and placement at RT-2, and is the least costly alternative. The City of Lorain will be 100 percent responsible for all activities and permits necessary to prepare the RT-2 site for placement of dredged material from the Federal Channel. It is anticipated that RT-2 will be available for use no later than 2014.

2.14.3 Risk and Uncertainty - Risk and uncertainty are intrinsic in water resources planning and design. All measured or estimated values in project planning and design are to various degrees inaccurate. Invariably, the true values are different from any single point values presently used in project formulation, evaluation and design.

The USACE develops best estimates of key variables, factors, parameters and data components in the planning and design of DMMPs. These estimates are considered the "most likely" values. Budget constraints, increased customer cost sharing requirements and public concern for project performance are issues that have been addressed in this document. (ER 1105-2-101, January 3, 2006).

2.14.4 Real Estate – The City of Lorain is required to provide, without cost to the United States, unencumbered, all lands, easements and rights of way and spoils disposal areas necessary (LERRD). The City will be required to have fee title and provide a 20 year Right of Entry for Construction for RT-2. A MOA (in lieu of a PCA) will be signed by the District Commander, after receiving all appropriate approvals from higher levels, which will address any required hold-harmless issues. These agreements will ensure capacity for Federal dredged material management for a minimum 20-year period and the agreements will preclude the City of Lorain from charging USACE a tipping fee. Since the City will be the permanent landowner of RT-2, they will be required to obtain applicable State and Federal permits, and modify the property as necessary to comply with those permits and other applicable regulations at 100 percent non-Federal cost. The real estate plan is provided in Appendix K.

2.15 COST-SHARING

2.15.1 Base Plan Impact on Cost-Sharing - The Base Plan defines the parameters to be used when determining cost-sharing for all other alternatives which may be developed during the study and which may eventually be put forward as the selected plan for this dredged material management study.

2.15.2 Cost-Sharing Implementation – In general, the costs for implementing dredged material management plans for existing projects such as Lorain Harbor are shared in accordance with navigation O&M cost-sharing provisions applicable to the authorized navigation project. Costs for new CDFs are cost-shared in accordance with Section 201 of the Water Resources Development Act of 1996 (P.L. 104-303) and United States Code (33 USC 2211). For commercial navigation projects where authorized depths range from greater than 20 to 45 feet, non-Federal sponsors are responsible for 25 percent of the initial cost of the facility and 100 percent of the cost of all LERRDs. The non-Federal sponsor must also pay an additional 10 percent of the total project cost after construction over a maximum 30- year period. The non-Federal costs of LERRDs (other than utility relocations) needed for the project is credited against this extra 10 percent non-Federal cost.

2.15.3 Cost-Sharing of Beneficial Use Measures or Alternatives - Dredged or excavated material from a Federal navigation project can be used in the construction of a facility which not only serves as a disposal facility but also serves for another purpose, such as a parking lot or

terminal facility. The costs allocated to disposal facility costs will be shared as general navigation feature (GNF) costs and the costs allocated to the end use of the facility will be non-Federal costs. The operation and maintenance cost of these facilities constructed for another purpose are not GNF operation and maintenance costs and are a non-Federal responsibility. Classification of costs for these facilities will be considered by HQUSACE on a case by case basis. (PGL No. 47, paragraph 5e). Construction costs for new land based and aquatic dredged material disposal facilities required for operation and maintenance of Federal navigation projects will be shared as general navigation features of the project under Section 101 of WRDA 86, as further amended by WRDA 96. The non-Federal sponsor will provide the lands, easements, and rights-of-way, and perform relocations (LERR) for the construction of the land based and aquatic disposal facilities (PGL No. 47, paragraph 7b (1)).

2.15.4 Cost-Sharing of State Requirements Exceeding the Federal Standard – In cases where a State agency imposes special requirements or alternatives for the placement of dredged material, over and above which is considered the Federal standard for that location, the additional costs associated with such requirements must be borne 100 percent by the non-Federal sponsor (33 CFR 337.2). The Federal Standard as defined in the 33 CFR 335.7 is:

“Federal standard means the dredged material disposal alternative or alternatives identified by the Corps which represent the least costly alternatives consistent with sound engineering practices and meeting the environmental standards established by the 404(b)(1) evaluation process or ocean dumping criteria.”

2.16 ITEMS OF LOCAL COOPERATION

2.16.1 Non-Federal Financing Plan – As of June 12, 2007, the requirement for a non-Federal sponsor to submit a financing plan for approval and preparation of an assessment by the District Commander is eliminated. Instead, a non-Federal sponsor will sign the non-Federal Sponsor’s Self Certification of Financial Capabilities for Agreements to self certify its financial capability to meet its obligations under a PCA or other agreement. Other non-Federal documentation may include a Letter of Intent, any legislation/legal actions that allow the non-Federal sponsor to execute a PCA or other agreement, and a statement of their acknowledged responsibilities with respect to Operation, Maintenance, Repair, Rehabilitation and Replacement (OMRR&R) costs upon completion of the project.

Although USACE could not secure a non-Federal sponsor for the Section 204 Black River Preliminary Restoration Plan, referenced in paragraph 1.12.4, the City is prepared to finance this alternative. The Section 204 study was limited to projects that had aquatic ecosystem restoration benefits, which the potential non-Federal sponsor(s) were not willing to cost-share. The brownfield restoration alternative includes measures that benefit the City’s plan to relocate and upgrade the WWTP in compliance with a consent decree.

2.16.2 Project Cooperation Agreement – Since the tentatively selected plan does not require a cost-shared construction project, this project does not require a PCA.

3.0 CHAPTER 3 – AFFECTED ENVIRONMENT

3.1 Introduction – The purpose of this section is to present an overview of the environmental setting in the Lorain Harbor study area to provide a basis by which to assess impacts and evaluate the various alternative plans.

3.2 Socioeconomics – Lorain is an important Great Lakes port city. Because of its location and transportation facilities, it has become an important local, State, regional, national, and World center of industry and commerce. This is expected to continue into the future.

3.3 Population - The City of Lorain is the largest city in Lorain County. Based on the 2005 U.S. Census of Population and Housing, total population of the city was 65,476, a decrease of 5 percent since the 2000 census. In 2005, the total population of Lorain County was 287,985, representing a 1.2 percent increase since 2000. Through 2030, Lorain County population is projected to grow to an estimated total of 316,207, or a 9.8 percent increase over the 2005 population (Ohio Department of Development-Office of Strategic Research).

3.4 Employment and Income - According to the U.S. Census Bureau, in 2005, the median household income was \$30,936 for City of Lorain and \$47,913 for Lorain County. Approximately 14.9 and 9.6 percent of the families in the City of Lorain and Lorain County respectively were below the poverty level. The 2005 employment by sector shows management, professional, and related occupations; productions, transportation, and moving management; manufacturing; and health care were the dominant employment sectors employing 26,846 people. Government employment accounted for over 15 percent. Major employers in Lorain County include Community Health Partners, Elyria City Board of Education, Emerson Electric/Ridge Tool, EMH Regional Medical Center, Invacare Corp., Lorain City Board of Education, Lorain County Government, Nordson Corp., Oberlin College, PolyOne Corp., Republic Engineered Products, and the State of Ohio. Table 3.1 displays the distribution of employment by occupation and industry for the City of Lorain. In 2005, the average unemployment rate for the City of Lorain was 13.3 percent (U.S. Census Bureau, 2005).

3.5 Business and Industry - Although waterborne traffic at Lorain Harbor has been comparatively stable for more than a decade, it is anticipated that future traffic will be greatly reduced due to the relocation of the harbor's iron ore transshipment facility to Cleveland Harbor in 2003. Iron ore has been the principal commodity at the harbor, with stone (limestone and gypsum) accounting for the remainder. Republic Engineered Products (REP) currently operates the specialty bar quality steelmaking operations at the harbor and supplies Lorain Tubular Steel that produces customized tubular steel products. Commercial industry located on the Black River has been discussed in further detail in Chapter 1, Section 1.5.

Table 3.1 - Occupation, Industry, and Class of Worker of Employed Civilians 16 Years and Over (U.S. Census of Population and Housing, 2005) – City of Lorain	
Occupation/Industry	Percent*
Management, professional, and related occupations	23.7
Educational services, health care, and social assistance	21.4
Service	20.0
Sales and office	21.9
Farming, fishing and forestry	0.4
Construction, extraction and maintenance	6.2
Production, transportation, and material moving	27.6
Agriculture, forestry, fishing and hunting (Industry)	0.4
Manufacturing (Industry)	23.1
Percent government workers (local, State, or Federal)	15.8

* Total exceeds 100 percent because some individuals are employed in more than one industry.

3.6 Community Cohesion - Community cohesion, as in most cases, is a function of a number of social and economic factors. Most people in the Lorain area are long-time residents of varied ethnic backgrounds. Generally, community pride is strong. With the recent expansion of mixed-use developments, the Lorain Harbor waterfront has grown to be a focus of community interaction. Lorain County has a notable family-friendly environment with convenient recreation areas, community festivals, special events, and a shared history.

3.7 Environmental Justice Communities - As outlined in Executive Order 12898, Federal agencies must evaluate environmental justice issues related to any project proposed for implementation. This evaluation includes identification of minority and low-income populations in the study area, identification of any negative project impacts that would disproportionately affect these low-income or minority groups, and proposed mitigation measures to offset the projected negative impacts.

A comparative analysis of 2000 census data for the city of Lorain indicates a substantial minority community in comparison to county and state percentages. The city and county data also indicates a notable percentage of families and individuals below the poverty level (Table 3.2).

Table 3.2 General Population Characteristics (U.S. Census of Population and Housing, 2005)			
	State of Ohio	Lorain County	Lorain (City)
TOTAL POPULATION	11,155,606	287,985	65,476
RACE AND HISPANIC ORIGIN (%)			
One Race	98.5	97.7	95.2
White	84.3	85.7	62.2
Black or African American	11.5	7.2	20.0
American Indian or Alaska Native	0.2	0.6	1.5
Asian	1.5	0.9	0.0
Native Hawaiian and Other Pacific Islander	0.0	0.0	0.0
Some other race	1.0	3.2	11.5
Two or more races	1.5	2.3	4.8
Hispanic or Latino (of any race)	2.3	7.4	22.8
POVERTY STATUS			
Families below poverty level	9.9	9.6	14.9
Individuals below poverty level	13.0	11.7	17.6

3.8 Land Use – Historically, the growth and development of Lorain Harbor was generally due to steel-making and ship-building. The harbor was once the home of the American Shipbuilding Company and the site of major steel-making operations under a sequence of various operators. As the local economy has changed, land use at the harbor is transitioning from industrial to a mix of commercial, recreational, and residential. Single-family dwellings overlook the existing CDF site along Lakeside Avenue. Industrial land use still occupies areas adjacent to the RT-2 Site.

3.9 Property Values/Tax Revenues - Based on the 2005 Lorain County Profile, the median value of owner-occupied housing units in Lorain County was \$115,100 (Ohio Department of Development). The taxable value of real property amounts to \$5.1 billion with residential values at \$4.1 billion; agriculture values at \$101 million; industrial values at \$204 million; commercial values at \$714 million; and mineral values at \$88,380. Based on 2007 information from the Lorain County Auditor, the estimated Lorain County tax percentage of fair market value for commercial/industrial/mineral, and residential/agricultural properties are 2.47 percent and 1.47 percent, respectively.

3.10 Transportation – Lorain Harbor is an important local, State, regional, and national port. The area is served via rail, road ways, and water.

3.10.1 Railroads - Lake Terminal Railroad Company is located in Lorain and serves harbors and cities along the Lake Erie shoreline. Lake Terminal Railroad is a terminal switching carrier that serves the Lake Erie shoreline industry via interchanges with

Norfolk Southern and CSX Transportation Inc. Lorain Tubular Steel and REP, two major industries located at Lorain Harbor, transport raw materials inbound and finished products outbound via railway services.

3.10.2 Roads - The City of Lorain is transected by major east/west and north/south highways including Interstate 90, State Route 611, and State Route 57, respectively. In addition to the interstate highway system, Lorain contains an intricate system of local roadways maintained by the City Street Department. Lorain County Transit (LCT) Authority operates 12 public transportation routes throughout the City of Lorain. LCT offers two park and ride locations and two connections to the Greater Cleveland Regional Transit Authority.

3.10.3 Navigation - Lorain Harbor is ranked 102nd in the nation based on the tonnage of material shipped from, or received at the port and is the 25th largest Great Lakes Port (based on 2005 data). Approximately 14 percent of the harbor traffic involves foreign trade or transportation. Historically, the dominant harbor commodities are iron ore, limestone, and gypsum that are used by the steel industry. The harbor handled a range of 14.2 million to 2.2 million tons per year from 2000 through 2005.

There have been major changes in tonnages moving through Lorain harbor since 2001, and all of it is due to changes in iron ore movements. The majority of the iron ore historically received at Lorain Harbor (about 70 percent) has been destined for an integrated steel mill located in Cleveland Harbor, Ohio, on the Cuyahoga River. By 2003 the Lorain pellet terminal transshipment facility had been bought by the integrated steel mill in Cleveland, Ohio, and completely relocated to Cleveland Harbor. Lorain Harbor no longer had any iron ore transshipments. Total tonnages moving through the Harbor fell to 3 million tons in 2005. This loss of tonnages at Lorain Harbor has been reflected in the economic evaluation by using 2005 tonnages that have passed through Lorain Harbor. These 2005 tonnages reflect the loss of the outer harbor iron ore transshipment facility to Cleveland, as well as a reduced level of iron ore and limestone needs at the current ICH steel making facilities at Lorain.

There were around 300 commercial vessel movements (inbound and outbound) in 2005. Approximately 75 percent of the inbound vessel movements drafted 23 feet or greater. This level of vessel activity is expected to continue over the project evaluation period of 2009-2028.

The existing Federal navigation project at Lorain Harbor is discussed in detail in Chapter 1, Section 1.6 of this report.

3.11 Water Quality/Water Resources – The Great Lakes are the world’s largest source of fresh water and serve as a valuable resource to 33 million people who live and work in the basin. Lake Erie is of particular importance to the State of Ohio. The lake provides drinking water to three million residents and generates approximately \$8.5 billion in annual revenue related to fishing, travel, and tourism. However, two types of pollution threaten the water quality of the Lake Erie watershed: point source and non-point source

pollution. Point source pollution is known sources of discharge such as industrial, residential, and combined sewer overflows. Non-point source pollution is unknown sources and is typically characterized by storm water runoff. The importance of maintaining the water quality of the Great Lakes has resulted in Federal, State, and local authorities taking action to promote reducing pollution and implement measures to protect the water resources.

3.11.1 Federal and State Resources - The Council of Great Lakes Governors (CGLG), which includes representatives from the Provinces of Ontario and Quebec, signed an agreement in December 2005 stating the need to protect, conserve, restore, and improve the waters in order to maintain sustainable water supplies to people and businesses within the Great Lakes Basin. The agreement is expected to be passed into law through an interstate compact and will be known as the 'Great Lakes – St. Lawrence River Basin Water Resources Compact.' In addition to the CGLG, State agencies and local entities strive to protect the Great Lakes and specifically Lake Erie as a viable water resource. ODNR maintains guidance and procedures in ORC 1521 to coordinate, conserve, develop, protect, use, and manage the water resources of the Lake Erie Drainage Basin. OEPA's Division of Surface Water is responsible for restoring and maintaining the quality of Ohio's rivers and streams by managing the water resources in compliance with the Federal Clean Water Act.

3.11.2 Local Resources - The City of Lorain public water intake is located in Lake Erie approximately 0.75 mile west of the existing CDF and 4.25 miles south of the open lake placement site. The Black River WWTP is currently located on the West pier in Lorain Harbor. The facility is 50 years old and receives sewage from the central west side, east, and south sides of Lorain, as well as from Sheffield Lake to the east. The plant is rated for a capacity of 15 million gallons of wastewater per day. During storm events, the plant has operated with a flow of more than 40 million gallons per day. The City of Lorain plans to relocate the WWTP to the 130 acre RT-2 property. The new facility will have capability to process 18 million gallons per day which will enable the City to meet EPA requirements. It is estimated to be a \$212 million project and will require sufficient time for planning, design, financing, and construction. Coordination with the stakeholder indicates that the timeline for construction of the wastewater treatment plant is scheduled for 2020 at the earliest.

3.11.3 Water Quality Standards - OEPA and ODNR have developed standards that outline applicable criteria to all waters in the State, as well as specific use designations for Ohio's Lake Erie coastal zone. It is the policy of the State of Ohio to maintain and improve the quality of the State's coastal waters for the purpose of protecting the public health and welfare and to enable the use of such waters for public water supply, industrial and agricultural needs, and propagation of fish, aquatic life and wildlife by assuring compliance with §402 CWA, O.A.C §3745, and O.R.C. §1506.23, §3734, and §6111. Lake Erie is designated Exceptional Warmwater Habitat, Superior High Quality Water, Public Water Supply, Agricultural Water Supply, Industrial Water Supply and Bathing Waters (OAC 3745-1-31). The Black River is assigned the following water quality use

designations: Warmwater Habitat, Seasonal Salmonid Habitat, Agricultural Water Supply, Industrial Water Supply, and Primary Contact Recreation (OAC 3745-1-27).

3.11.4 Ambient Water Quality - The entire Black River watershed has been designated as a Great Lakes AOC defined by the U.S.-Canada Great Lakes Water Quality Agreement (Annex 2 of the 1987 Protocol) as a "geographic area that fails to meet the General or Specific Objectives of the Agreement where such failure has caused or is likely to cause impairment of beneficial use or of the area's ability to support aquatic life". The Black River RAP, together with OEPA, are working together to address detrimental land use practices and associated non-point source pollution.

The Total Maximum Daily Load (TMDL) program, established under Section 303(d) of the CWA (33 U.S.C. 1313), focuses on identifying and restoring polluted rivers, streams, lakes and other surface waterbodies. A TMDL is a written, quantitative assessment of water quality problems in a waterbody and contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet water quality standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a waterbody. Under this law, each State is required to submit a prioritized list of impaired waters to USEPA for approval ["303(d) list"]. The list indicates the waters of Ohio that are currently impaired may require TMDL development in order to meet water quality standards. Load characterization studies for the Black River Watershed TMDL are currently underway.

In 1997, OEPA surveyed the Black River and six tributaries to determine their attainment of chemical and biological water quality criteria. The Black River mainstem is designated warmwater habitat from the confluence of its East and West Branches. The assessment included sampling for water and sediment chemistry and evaluation of fish and benthic macroinvertebrate communities during the summer low-flow period. The assessment is conducted on a five to ten year cycle by OEPA to evaluate the condition of the river and the impact of pollution sources on the health of the river. Overall, the biological community performance within portions of the Black River watershed sampled during 1997 showed few differences compared to the 1992 survey due to continued and pervasive non-point pollution and a few localized impacts from WWTPs, including the Black River WWTP. The lower reach of the river (from River Mile 6.8 to Lake Erie) did show improved Index of Biotic Integrity (IBI) scores, likely due to the combined result of lower pollutant loadings from upstream and the remedial dredging of sediments in the Federal Channel (U.S. Steel/Kobe site) to remove sediments heavily contaminated with polycyclic aromatic hydrocarbons (PAHs). Dissolved oxygen concentrations in the Federal Channel remained low during the summer due to combined WWTP loadings, the U.S. Steel/Kobe facility, and non-point sediment loadings. The low dissolved oxygen concentrations resulted in poor macroinvertebrate communities and, as a result, the lake influenced portion of the river was assessed as being in non-attainment of the biological water quality criteria (OEPA, 1999).

3.12 Background and Potential Sources of Sediment Contamination - Lorain Harbor is located within the Black River Great Lakes AOC. The Black River drainage basin is

dominated by almost 90 percent agricultural and rural land uses, with the remainder residential, industrial and recreational uses (OEPA 2006). RTI is the primary industry located adjacent to the upper end of the Black River Channel. Its predecessor (USS/KOBE Steel Company) operated a coking facility until 1982 that was considered to be the major source of polycyclic aromatic hydrocarbons (PAHs) to the lower Black River. Although levels of PAHs in this area of the river declined since 1982, they continued to be of concern. Therefore, in 1985 USEPA issued a Consent Decree requiring the removal of 38,000 cy of PAH-contaminated sediments in the Black River, just upstream of the River Channel near the coke plant outfall. This action was completed in 1990 and by 1992 PAH concentrations in the area declined by 8 to 95 percent. Although RTI is the only industrial discharge characterized as a 'major' source of pollution, there are 26 industrial and 19 municipal permitted National Pollution Discharge Elimination System (NPDES) wastewater discharges along the Black River.

3.13 Sediment Quality - USACE, Buffalo District conducts sediment sampling in Lorain Harbor and the Black River every five years. Lorain Harbor sediments (including the Black River) were last sampled and analyzed by the Buffalo District for physical and chemical analysis in 2005 and biological analysis in 2006 by contract with Engineering and Environment, Inc. (EEI) and ASci Corporation, respectively. Using the recent data, USACE, Buffalo District completed a Tiered Evaluation in accordance with guidelines contained in the *USEPA/ USACE Great Lakes Dredged Material Testing and Evaluation Manual* (1998). In 2005 bulk surface grab sediment samples were collected from the River Channel (Sites LR-1 through LR-9), open lake reference (LL-1 through LL-4), and designated open lake placement areas (LD-1 and LD-2) in Lake Erie (Figures 3.1 through 3.2)(Appendix F). Figure 3.3 identifies the management units used to divide the river into segments for more detailed analysis (Appendix F). One Quality Control (QC) sample was run on the sediments collected from Site LR-5. All samples were analyzed for particle size, bulk inorganics, PAHs, polychlorinated biphenyls (PCBs), and pesticides; the sediment sampling and analysis plan was coordinated with OEPA.

3.13.1 Physical Testing - Table 3.3 in Appendix F presents the results of the 2005 grain size analysis of the River Channel sediment samples. With the exception of Sites LR-1 and LR-9, bottom sediments collected from the channel ranged from 83.8 to 97.9 percent silts/clays. Sediments collected from Sites LR-1 and LR-9 contained notably more coarse-grain material, having only 66.1 and 47.3 percent silts/clays, respectively. Sediments collected from the open lake reference area were comprised of between 84 and 99.3 percent silts/clays with the remainder sand. At the open lake placement area, sediments were comprised of mostly coarse-grain particles (82.6 to 87.2 percent sands/gravels), with the remainder silts/clays.

3.13.2 Chemical Testing (Inorganic analyses) - Table 3.4 in Appendix F presents the results of the 2005 inorganic analyses on the River Channel and open lake sediments. Generally, metal concentrations for the River Channel sediments were lower than those found at the open lake reference area. Arsenic concentrations at many of the sites exceeded the open lake reference area levels, ranging from 7.5 to 12.1 mg/kg. In addition, manganese levels at various River Channel sites (590 to 930 mg/kg) exceeded

those relative to the open lake reference area. Such levels of arsenic and manganese are not of significant toxicological concern. At Sites LR-8 and/or LR-9 within the LRB-1 Management Unit near the mouth of the Black River, concentrations of beryllium, cadmium, copper, lead, silver, zinc, and cyanide significantly exceeded open lake reference area levels. However, only the levels of beryllium (2.72 to 4.03 mg/kg), cadmium (8.68 to 14.8 mg/kg), zinc (529 to 844 mg/kg) and possibly cyanide (1.67 to 4.28 mg/kg) would be of potential concern at both of these sites. Therefore, these heavy metals are considered to be contaminants of concern (COCs) at these sites within this reach of the River Channel. Total organic carbon (TOC) levels were fairly consistent across the River Channel sites, ranging from 2.66 to 3.61 percent. Some of the heavy metal concentrations in the two samples from the open lake placement area significantly exceeded those of the open lake reference area, including cadmium, chromium, zinc and cyanide. TOC levels ranged from 2.42 to 4.28 percent, which is relatively high when considering the predominant coarse-grain nature of the sediments.

3.13.3 Polycyclic Aromatic Hydrocarbons (PAH) (Organic analyses) - Table 3.5 in Appendix F presents the results of the 2005 PAH analyses on the sediment sampling. Total PAH levels in all of the River Channel sediment samples ranged from 1.12 to 5.6 µg/kg and exceeded those measured at the open lake reference area. Benzo(a)pyrene (BaP), a potent carcinogenic PAH compound (toxic equivalency factor [TEF] = 1.0; Safe, 1998), consistently comprised between 7 and 9 percent of the total concentration. Another potent compound, dibenzo(a,h)anthracene (DBaA) (TEF = 1 to 5; Nisbet and Lagoy, 1992), consistently comprised 1 to 2 percent of the total concentration in the samples. Among all traditional carcinogenic compounds (including BaP and dibenzo(a,h)anthracene) with TEFs ranging from 0.1 to 1.0, concentrations comprised between 34 and 42 percent of the total concentration across these sediment samples. Since most of the PAH compound concentrations in the River Channel sediments were significantly higher than those at the open lake reference area, they were preliminarily treated as COCs at all of the sites. Table 3.6 in Appendix F is a sum percentage of PAH compounds found in Lorain Harbor.

3.13.4 Polychlorinated Biphenyls (PCB) - Table 3.7 presents the results of the PCB analyses on the River Channel and open lake sediment samples. All PCBs were quantified as Aroclors. No Aroclors were detected in any of the sediment samples. Laboratory Reporting Limits (LRLs) for the River Channel sediments ranged from 1.80 to 2.54 µg/kg. In the open lake reference and placement area sediments, LRLs ranged from 4.67 to 4.92 and 1.63 to 1.88 µg/kg, respectively.

3.13.5 Pesticides - Pesticides concentrations were generally non-detectable in virtually all River Channel samples with LRLs ranging from 1.08 to 1.52 µg/kg (Table 3.8). Gamma-chlordane was detected at 3.85 µg/kg at Site LR-7 and methoxychlor was detected at 2.08 µg/kg at Site LR-8. In addition, 4,4'-dichlorodiphenyldichloroethane (DDT) was measured at 2.41 µg/kg at Site LR-9. Only the gamma-chlordane concentration was significantly elevated relative to the open lake reference area levels. Such levels of gamma-chlordane, 4,4'-DDT (or Σ DDT) are not considered to be of

significant toxicological concern. Pesticides were not detected in the open lake reference area sediments at LRLs ranging from 1.87 to 1.97 µg/kg.

3.13.6 Elutriate Testing - Elutriate testing for inorganics, PAHs, PCBs and pesticides was performed on all of the River Channel sediment samples. Elutriate test results on composited sediment samples LR-1, LR-2 and LR-3 from 2005 are presented in Tables 3.09 through 3.12 (Appendix F). Low releases of some metals and nutrients were evidenced in many of the sediment samples. No releases of PAHs, PCBs or pesticides were measured at reporting limits of 0.2, 0.5, and 0.1 µg/kg, respectively.

3.13.7 Bioassay – A total of three management units (LRB-1, 2, and 3) within the Black River were tested to assess survivability of two species: *C. tentans* and *H. azteca*. In 2005 and 2006, two and one prescribed solid-phase bioassays were applied to composite River Channel Management Unit sediments LRB-1 through LRB-3, respectively (Table 3.13 and 3.14) (Appendix F).

3.13.7.1 2005 Bioassay Results - The 2005 bioassay data suggest sediments within Management Units LRB-1 showed insignificant toxicity, LRB-2 showed insignificant acute toxicity, and LRB-3 showed marginal acute toxicity with respect to *C. tentans* survival bioassay. Although 2005 sediment data results identify PAHs as the sole COC within the sampled reach of the River Channel, bioassay results indicate that the concentrations of beryllium, cadmium, zinc,, cyanide, and PAHs, all of which were identified as COCs, were not toxicologically significant. Results lead to the assumption that bioassay results of River Channel sediments with similar or higher levels of PAHs would not be the cause of the evidenced acute toxicity.

3.13.7.2 2006 Bioassay Results - In order to verify the results and conclusions relative to the 2005 bioassay tests, the *C. tentans* solid-phase bioassay was re-applied in 2006 to additional sediment samples collected from River Channel Management Units LRB-1 through LRB-3. Management Units LRB-1 and LRB-2 showed insignificant toxicity and met the survival guideline. However, sediments from Management Unit LRB-3 did not meet the survival guideline. With respect to the growth measurement endpoint, sediments from Management Unit LRB-1 and LRB-2 met the growth guideline. However, sediments from Management Unit LRB-3 did not meet the growth guideline.

3.13.8 Summary of 2005 and 2006 Bioassay - These test results were consistent with the 2005 bioassays as they evidenced acute toxicity associated with Management Unit LRB-3 sediments that could not be attributed to any specific COC. Follow-up *C. tentans* bioassay testing that treated Management Unit LRB-3 sediment with zeolite to reduce the toxic effects of ammonia indicated that ammonia was not associated with the significantly reduced survival and growth (ASCI, 2006b).

3.13.9 Final COC List - No final COCs were identified in the River Channel sediments. However, significant acute toxicity was indicated in sediments in Management Unit

LRB-3. Further treatment and testing of this sediment sample indicated that the acute toxicity was not attributable to ammonia. The toxicity associated with Management Unit LRB-3 sediments may be related to a non-contaminant factor(s).

3.13.10 Sediment Analysis Conclusion - In summary, the evaluation of these data and analyses concluded that all material to be dredged at Lorain Harbor from the Outer Harbor and River Channel downstream to an area approximately 1,300 feet upstream of River Mile 2 meets Federal guidelines, and therefore has been determined to be suitable for unconfined open lake placement. Harbor sediments in the upstream portion of the Black River Channel, as represented by Sites LR-1 through LR-3 and corresponding Management Unit LRB-3, do not meet Federal guidelines for open lake placement.

3.14 Hazardous, Toxic, and Radioactive Wastes (HTRW) - In 2004, USACE utilized the services of Environmental Data Resources, Inc. (EDR) to execute a search of the environmental databases to identify HTRW sites within one mile of RT-2 (Table 3.15).

Table 3.15 - Results of Environmental Database Search (EDR, 2004)	
(Approximate Minimum Search Distance = 1 mile unless otherwise noted)	
Database	Records Review Results
NPL	No sites listed.
Proposed NPL	No sites listed.
CERCLIS	No sites listed (0.5 mi).
CERCLIS-NFRAP	The entire U.S. Steel Site is a CERCLIS-NFRAP-designated site (0.25 mi).
CORRACTS	The entire U.S. Steel Facility was assigned a medium corrective action priority in 1991.
RCRIS	Forty-five (45) RCRIS violations reported from 1986 to 2003 on the U.S. Steel Property. (0.5 mi).
ERNS	No sites listed (Target Property).
FINDS	No sites listed (Target Property).
PADS	The RTI property is a PADS-listed site (Target Property).
TRIS	The RTI property is a TRIS-listed site (Target Property).
SWF/LF	No sites listed (0.5 mi).
LUST	Three leaking underground storage tanks reported for the RTI property (0.5 mi).
UST	Three active underground storage tanks reported for the RTI property (0.25 mi).
DERR	Lorain City Landfill located on State Route 611/Root Road,

	approximately ½ mile ENE of RT-2 (north of the Black River).
VCP	No sites listed (0.5 mi).
SPILLS	A small hydrocarbon discharge to the Black River was reported by USS Kobe Steel in 1997 (Target Property).
Former Manufactured Gas (Coal Gas) Sites	Lorain Gas Company located at 431 East 21 st Street, approximately ¾ mile WNW of RT-2.

RTI properties populated on many of the queried databases. However, OEPA has various programs to encourage the remediation of brownfields including the Voluntary Action Plan and Brownfields Program. Ohio's VAP was implemented in 1997 in order to give industry an incentive to investigate possible environmental contamination, remediate if necessary, and receive a promise from the State that no further remediation would be needed. Financial incentives are available through the Ohio VAP to local, private, and public entities that conduct voluntary cleanups. In 1995, USEPA instituted the Brownfields Program to promote reuse and redevelopment of brownfields. The City of Lorain has purchased the RT-2 site from RTI for the purpose of development. It is the intent of the City to develop RT-2 for the relocation of the Black River WWTP. The plant would occupy approximately 40 acres of the 130 acre former coke plant site. Based on the Ohio VAP, an estimated two feet of cover of dredged material/sewage sludge would be sufficient to meet industrial use criteria for the protection of human health. A 10 foot cover would be required for residential development and would be sufficient to protect ecological receptors. For recreational use, the cover may be between 2 and 10 feet. Further evaluation of site-specific criteria and additional end use of the remaining 90 acres will be required in order to ascertain the final depth of cover. Conceptual methods to fill and cover RT-2 site estimate a depth of coverage ranging from 7.5. to 9 feet and are described in detail in paragraphs 2.12.2.2 and 2.12.2.3 of Chapter 2.

3.15 Cultural Resources – Definition and Area of Potential Effect - Cultural resources are the material remains of past human activities. They can consist of objects, buildings, structures, sites or districts (a group of closely associated sites). For the DMMP study, the Area of Potential Effect (APE) consists of the Federal Harbor, including all harbor structures and channels, the proposed CDF site, RT-2 and adjacent lands, and the harbor's designated open lake placement site.

3.15.1 Cultural Resources – Significance - Federal agencies' cultural resources responsibilities are defined in a series of laws and regulations that have been promulgated over the years. The most comprehensive and far reaching of these is the National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. 470). The NHPA, together with its implementing regulations (36 CFR Part 800), lays out a process for agencies to follow to accommodate historic preservation concerns with the needs of Federal undertakings. Under Section 106 of the NHPA, Federal agencies must take into account the effect of their undertakings on historic properties included in or eligible for inclusion in the National Register of Historic Places (NRHP). As part of its required

Section 106 consultation process, USACE also routinely works with appropriate State Historic Preservation Offices (SHPO), Native American Indian Tribes, and other interested parties in managing historic properties found in the APE.

An historic property is any prehistoric or historic district, site, building, structure or object included in or eligible for inclusion on the NRHP. Such properties may be significant for their historic, architectural, engineering, archeological, scientific or other cultural values, and may be of national, regional, State, or local significance. The term includes artifacts, records, and other material remains related to such a property or resource. It may also include sites, locations, or areas valued by Native Americans because of their association with traditional religious or ceremonial beliefs or activities.

Significance is a term attributable to properties listed in or determined to be eligible for listing in the NRHP (36 CFR Part 60.4). According to these criteria for evaluation, "(t)he quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association, and

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that have yielded, or may be likely to yield, information important in prehistory or history.

3.15.2 Cultural History - Human habitation of the Lorain area goes back to the Archaic period, around 6500 BC, when the area was settled because of its abundance of natural resources. A hunter/gatherer lifestyle evolved into a semi-agricultural existence practiced by the Adena culture by the start of the Early Woodlands period, around 1000 BC. The Adena culture is well known for its construction of burial mounds throughout central Ohio. The Hopewell culture emerged in this area around 100 BC and their people traveled, traded and hunted throughout northern Ohio and the Black River watershed. Several Hopewell artifacts from the Early and Middle Woodland period have been located at the Eiden site, a Late Woodland site located at the confluence of the Black River and French Creek, on the French Creek Reservation. Carbon- 14 dates from the Eiden site have dated to 1490 AD. The Eiden site was partially excavated between 1955 and 1964 by A. Bungart of Avon, Ohio. His excavations recorded over 235 burials indicating the site was also a cemetery. The Lorain County Metro Parks has documented an analysis of the artifacts and information he collected.

Several significant archeological districts dating from the Late Woodlands Period to approximately 1600 AD are located along the mainstem of the Black River and continue east to Cleveland. Archeological investigations of some of these sites began as early as

the 1870's when David C. and Charles C. Baldwin first excavated the Burrell Fort site. Partial records are on file at the Western Reserve Historical Society Museum in Cleveland under the title of the Baldwin Collection. Following their work, Emerson Greenman, Curator of Archeology for the Ohio Historical Society, conducted test excavations in 1929. Records of his work are on file at the Ohio State Museum in Columbus. (Northeast Ohio Areawide Coordinating Agency, 2007, www.noaca.org/index.html)

European contact occurred in the late 1700's with farmers and traders venturing to northeastern Ohio. By 1819, the first wooden ships were built at Lorain Harbor. In 1898, Lorain's first steel ship, the *Superior City*, was launched and was the largest vessel on fresh water. Shipbuilding continued to be important through both World Wars and the *U.S.S. Lorain* was launched in 1944 (Black River Historical Society, 2007, <http://www.loraincityhistory.org>).

The first steel plant was built in Lorain in 1894 by the Johnson Company. The steel mill attracted laborers from steel towns in Pennsylvania as well as immigrants from Europe. By the 1920's the steel mills had become the equivalent of small, self-contained cities. After many ups and downs, the steel plant still exists today. In 1986, the steel plant was operated by USX Corporation and from 1989 to 1999, by USS/Kobe. In 1999, it divided into two companies: Lorain Tubular Steel and RTI (now REP).

3.15.3 Existing Cultural Resources Environment (NRHP-listed/Eligible Properties)

- A number of historic properties including archaeological sites, buildings, and NRHP-listed properties are present along the Black River in Lorain County. The first lighthouse was built at the Black River in 1836. The Lorain Lighthouse, constructed in 1917, is listed on the NRHP. The former U.S. Coast Guard lighthouse was listed on the NRHP on December 29, 1978 and is currently owned and maintained by the Port of Lorain Foundation, Inc. (Lorain Port Authority, 2007, www.lorainportauthority.com/lighthouse/timeline.shtml). However, since the harbor dredging locations, open lake placement site, areas adjacent to the breakwaters, and RT-2 have been previously disturbed by past dredging, construction, and placement activities, no intact historic properties are expected to be present within these affected areas.

3.15.4 Indian Tribes and Communities (Federally Recognized Tribes) - Prior to the arrival of the first European settlers, Ohio was home to numerous Indian tribes. Although there are currently no Federally recognized tribes that reside within the State as a result of conquest, treaties, land cession and relocation, several Federally recognized tribes maintain an important cultural connection to their ancestral lands. Consequently, USACE is obligated to consult with these tribes in order to meet trust and treaty responsibilities and address their concerns relative to natural and cultural resources within the basin. For this study, the identification of ancestral lands and a corresponding compilation of Federally recognized tribes have been established through reviews of available tribal histories, mapping of Indian land areas judicially established through the U.S. Indian Claims Commission or U.S. Court of Claims in 1978, and previous consultations with the individual tribes ([Indian Land Claims Judicially Established](#),

[1978](#)). A list of Tribes that have been consulted during the course of this study are listed in Chapter 8 – Coordination/Consultation. Comments and/or concerns received by the Tribes can be found in Chapter 6 – Coordination, Consultation, and Public Involvement.

3.15.5 Government-to-Government Relations - Several Federal laws, executive orders, policy directives, and Federal regulations address responsibilities of the executive branch agencies regarding tribal interests. Collectively, these form the basis of how consultation is conducted and have had a profound impact on Federal-Tribal relations. Examples of the statutes specifically discussing tribal interests are National Environmental Policy Act, National Historic Preservation Act, Archeological Resources Protection Act, Native American Graves Protection and Repatriation Act, and American Indian Religious Freedom Act. Executive orders and presidential memoranda direct Federal agencies to respect tribal rights to self-government, consult with tribes on a government-to-government basis prior to taking actions that may affect tribes, and assess the effects of Federal actions on trust resources.

Specifically, places of cultural and religious significance to tribes are to be considered by Federal agencies in policy and project planning. The Corps is increasingly engaging in involving tribes in collaborative processes designed to facilitate the exchange of information and to effectively address effects of Federal actions and policies on tribal interests and rights.

3.16 Aesthetics - The view of Lake Erie offers an aesthetically pleasing experience for visitors to the Lorain Harbor waterfront. Enjoyable views within the study area include parks, marinas, residential, and commercial (i.e., restaurant) areas. Pervasive industrial development throughout the harbor including former lumber yards, steel mills, and shipbuilding and transportation (i.e., roads, railroads) facilities provide the attributes of a built environment rather than a more natural setting. Steel mills, barren slag disposal and excavation areas, and extensive bulkheads along the Black River reflect Lorain Harbor's industrial history. Improvements in aesthetic characteristics are increasingly evident on the waterfront and various reclamation and development projects along the waterfront have significantly improved local aesthetic qualities. Views of the harbor, Lake Erie, and the uninterrupted horizon consistently attract visitors to the harbor area. As the waterfront transitions from an industrialized waterfront to a mixed-use development waterfront, the aesthetic qualities of the harbor are expected to continue to improve.

3.17 Recreation Facilities and Activities - The Lorain Port Authority (LPA) owns Riverside Park and Lakeside Landing along the east bank of the Black River and an additional 70 acres along the west bank. As Lorain Harbor transitions from a predominantly industrial waterfront to a mixed-use development, the LPA has partnered with the City of Lorain to proceed with plans for waterfront development along the Lake Erie lakefront. The site of the former Lorain Pellet Terminal, located along the west bank immediately upstream of the Erie Avenue Bridge, has been developed as Black River Landing and the multi-modal Black River Transportation Center. Black River Landing includes the Black River Center Building, docks for excursion vessels, festival pavilions,

a promenade, walkways, patios, and parking areas. The Transportation Center will eventually link highway, rail, waterborne, and pedestrian transportation to the waterfront.

Recreational boating, fishing, and fishing charters are all popular recreational activities at Lorain Harbor. The Lorain Small Boat Harbor (Spitzer Lakeside Marina) is a 600 slip marina that adjoins the harbor's East breakwater shorearm and the existing CDF. Parking areas for the marina have expanded into a portion of the CDF. The CDF is also accessible to the public and although not authorized for recreational use, it is used by community members for walking, bird watching, and shore based fishing.

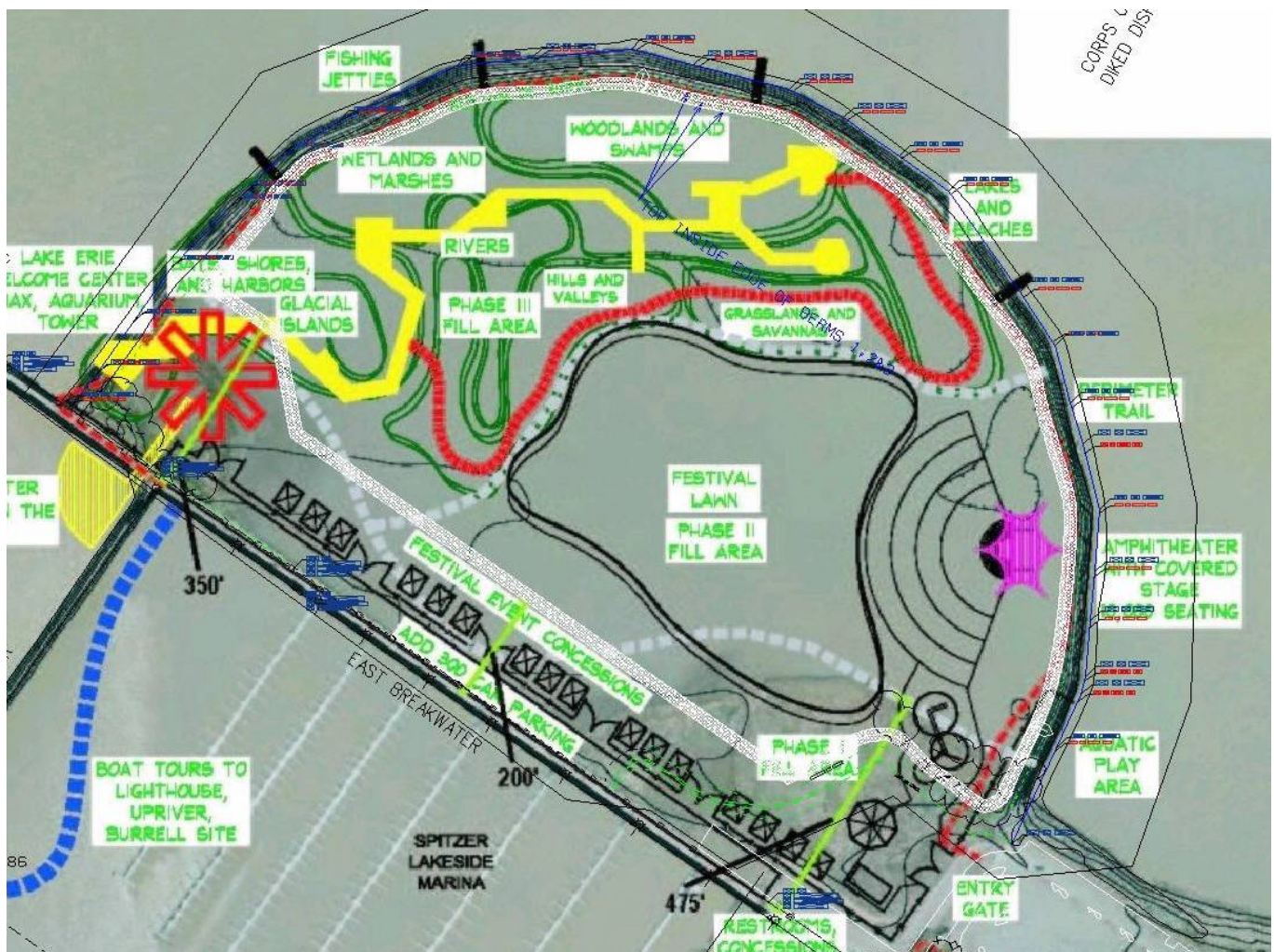
Lorain County Metro Parks and Lorain Port Authority have developed a CDF Master Plan for recreation activities once the facility is transferred to their ownership (Figure 3.4). In addition, there are numerous marinas and boating services located along the 20 mile Lake Erie shoreline. These facilities accommodate thousands of recreational vessels. Considerable recreational boating activity (including cruising, waterskiing, swimming, and fishing) occurs both within and outside the harbor area. Popular sport fish species that are abundant in Lorain Harbor, include walleye (*Stizostedion vitreum*), steelhead trout (*Oncorhynchus mykiss*), smallmouth bass (*Micropterus dolomieu*), and perch (*Perca flavescens* and *Morone americana*).

The Lorain County Metro Parks system contains 22 parks with a unique blend of development and preservation, recreation, and conservation. Within the Black River watershed, French Creek Reservation and Black Creek Reservation provide a total of nearly 1,000 acres of woodlands and meadows along the stream corridors of the upper Black River and several of its tributaries. The parks offer opportunities for play areas, hiking, biking, picnicking, fishing, hunting, camping, cross-country skiing, and nature study.

3.18 Aquatic Resources – Aquatic resources in the project area include fish, vegetation, and benthos and phytoplankton.

3.18.1 Aquatic Resources (Fish) - ODNR, Division of Wildlife conducts annual sport and commercial fisheries surveys and population assessments of Lake Erie. Lorain Harbor is located in the central basin of Lake Erie, a portion of which is designated by ODNR as District 2 for management purposes. Surveys of private and charter fishing boats indicate that yellow perch and walleye dominate annual harvests off Lorain Harbor. Other species of importance to the local sport fishery include white bass (*Morone saxatilis*), smallmouth bass, largemouth bass (*Micropterus salmoides*), freshwater drum (*Aplodinotus grunniens*), channel catfish (*Ictalurus punctatus*), white perch (*Morone americana*), and steelhead trout. Yellow perch, white perch, freshwater drum, channel catfish, and white bass make up the majority of the commercial fish harvest. Trawl and gill net surveys were conducted in 2005 for walleye, yellow perch, white bass, smallmouth bass, white perch, lake whitefish, and various forage fish. In terms of their relative abundance, white perch, yellow perch and white bass were generally the dominant predator species, and round goby, emerald shiner, gizzard shad and rainbow smelt were the dominant forage species in District 2 (ODNR, 2006).

Figure 3.4 Lorain County Metro Parks and Lorain Port Authority CDF Master Plan



The nearshore zone north of the Outer breakwater (i.e., the proposed CDF site described in Alternative 1) provides a relatively sheltered area for the growth and survival of young fish, particularly where vegetation is sparse. Water depths in this area range from 20-28 feet (NAD 1985). In 2000 through 2002, the U.S. Geological Survey, Great Lakes Science Center conducted nearshore larval fish surveys at Huron, Vermilion, and Lorain Harbors.

The study areas included a four kilometer radius sampling grid centered on each river mouth. During the three year sampling period, fewer fish were captured. In 2002, the Lorain Port Authority with the assistance of the Black River RAP, constructed a shallow water fish shelf as part of a brownfield riverfront redevelopment. The shelf creates 800 feet of diversified riparian habitat along the lower Black River at Black River Landing and provides in-stream habitat, spawning areas, and shelter for young fish.

3.18.2 Aquatic Resources (Vegetation) - Since Lorain Harbor's channels and turning basins are maintained to a depth of over 25 feet, requisite conditions to establish submerged or floating aquatic vegetation within the maintained portions of the Federal harbor are limited. Small sections of rooted vegetation are present in shallow portions of the river adjacent to the Federal Navigation Channel, particularly upstream of the Norfolk Southern railroad bridge. This vegetation consists primarily of phragmites (*Phragmites* spp.) and some cattails (*Typha* spp.). These areas are not normally dredged by USACE. As with the navigation channel and harbor area, no submerged or floating vegetation is present in the open lake placement area due to water depths of over 35 feet, as well as wind and wave action. Aquatic vegetation at the Outer breakwater at the proposed CDF site (discussed in Chapter 2, Section 2.11.1.4.2) is generally lacking except for algal growth (primarily *Cladophora*) along submerged portions of the structure.

3.18.3 Aquatic Resources (Plankton and Benthic Organisms) - From 2000 through 2002, the U.S. Geological Survey, Great Lakes Service Center sampled west central basin of Lake Erie nearshore sites at Huron, Vermilion, and Lorain. The study found that zooplankton composition in the coastal areas was mainly dominated by three groups: dreissenid veligers, copepod nauplii, and rotifers. The survey of benthic invertebrate communities on hard and soft substrates showed that oligochaetes were the most common invertebrate taxa over the three years and at the three sites in soft substrate. Chironomids, nematodes, and clams were the other abundant taxa. Lorain had fewer clams and more chironomids than the other two sites (Savino *et al.*, 2003).

3.19 Terrestrial Resources – Terrestrial resources in the project area include upland vegetation, and wildlife including threatened and endangered, and listed species.

3.19.1 Terrestrial Resources (Vegetation) - Historically, prominent vegetation types at Lorain consisted of beech (*Fagus* spp.) forest, prairie grasslands, elm-ash (*Ulmus* spp. and *Fraxinus* spp.) swamp forests, and mixed mesophytic forest. The mesophytic forests a mixture of hardwoods and softwoods, consisting of great-crowned oaks (*Quercus* spp.) forming a tall, dense forest, mixed with hickory (*Carya* spp.), walnut (*Juglans* spp.), and yellow poplar (*Liriodendron tulipifera*) on the lower slopes of rivers with ash and elm on

the higher slopes. Today, the area has been substantially modified by intensive land use development. By and large, natural vegetation at Lorain Harbor has been cleared for industrial, commercial, and residential development. In the upper watershed, these forests have been cleared for agricultural use. Table 3.16 summarizes Lorain County's current land cover.

Table 3.16 - Land Cover - Lorain County (Ohio Department of Development, Lorain County Profile)	
Land Cover	Acres
Urban (open impervious surfaces)	23,577.1
Agriculture/Open Urban Areas	195,026.7
Shrub/Scrub	975.9
Wooded	87,945.6
Open Water	2,208.2
Non-forested Wetlands	5,925.0
Barren	203.9
Total	315,862.3

The existing CDF is essentially filled to capacity and is vegetated by phragmites, cattails, cottonwoods (*Populus spp.*), and willows (*Salix spp.*). The shoreline east of the facility consists of a narrow concave sand and gravel beach backed by an approximate 20-25 foot high bluff. Ground cover above the bluff includes mowed grasses and scattered trees. An approximately 250 foot long rubblemound revetment has been installed at the eastern end of the beach. RT-2 is predominantly covered with barren slag piles, some tree, shrub, and reed growth along intermittent drainage ways. Slopes along the Black River streambank have retained a relatively good vegetative cover and are densely vegetated with riparian forest (50 to 500 feet wide).

3.19.2 Terrestrial Resources (Wildlife) - The study area is located at the intersection of principal routes of the Atlantic Flyway, which are major migration routes for at least 22 species of waterfowl. Ten of these species are seasonally common to abundant at Lorain Harbor; these include mallard (*Anas Platyrhynchos*), redhead, canvasback (*Aythya valisineria*), greater scaup (*Aythya marila*), lesser scaup (*Aythya affinis*), common goldeneye (*Bucephala clangula*), bufflehead (*Bucephala albeola*), ruddy duck (*Oxyura jamaicensis*), common merganser (*Mergus merganser*), and red-breasted merganser (*Mergus serrator*). Other waterfowl that are found in the area in high numbers include Canada geese (*Branta Canadensis*), horned grebe (*Podiceps auritus*), pied-bill grebe (*Podilymbus podiceps*), American coot (*Fulica americana*), herring gull (*Larus argentatus*), ring-bill gull (*Larus delawarensis*), common tern (*Sterna hirundo*), and Caspian tern (*Hydroprogne caspia*). The scrub/shrub and woodlands within the CDF and along the Black River at RT-2 also provide nesting and feeding habitat for a number of songbirds.

Notable waterfowl that use the lower Black River and the existing CDF include great blue herons (*Ardea Herodias*), black-crowned night herons (*Nycticorax nycticorax*),

green herons (*Butorides virescens*), and kingfishers (*Alcedo atthis*). Snowy owls (*Nyctea scandiaca*) can also be observed at the harbor during the winter. A significant great blue heron rookery is located along the left streambank adjacent to RT-2. ODNR, Division of Natural Areas and Preserves has identified 17 active nests within the rookery. In Ohio, great blue heron breeding occurs generally from the end of March through mid-April. The hatching period begins 28 days after of incubation, usually reaching its peak in May. Once the young herons hatch, they are helpless. After about 60 days, the young birds will have matured enough to leave the nest ([ODNR-Division of Wildlife](#)). Colonies usually exist at the same location for many years, and productivity may be positively related to the number of years colonies have been in use. Colonies located in close proximity to existing human activities may tolerate more disturbance than colonies located in undisturbed areas. The Great Blue Heron is considered a migratory bird and is therefore protected by the Migratory Bird Treaty Act of 1918. Since herons require sizable fish populations, the location of a heron rookery on the former steel plant property is indicative of improved water quality.

Typical mammal species that are expected to utilize both the existing CDF and RT-2 site include white-tail deer (*Odocoileus virginiana*), raccoon (*Procyon lotor*), red and grey fox (*Urocyon spp.*), skunk (*Mephitis mephitis*), cottontail rabbit (*Sylvilagus floridanus*), muskrat (*Ondrata zibethica*), opossum (*Didelphis marsupialis*), groundhog (*Marmota monax*), gray squirrel (*Sciurus Carolinensis*), chipmunk (*Tamias spp.*), Norway rat (*Rattus norvegicus*), field mouse (*Microtus Pennsylvanicus*), moles and voles (*Ellobius tancrei*).

3.19.3 Threatened and Endangered Plant Species - To date, no threatened or endangered plant species have been identified in the study area.

3.19.4 Threatened and Endangered Animal Species - The proposed project also lies within range of the following federally listed endangered (E) and candidate (C) species: Indiana bat (*Myotis sodalis*) (E); piping plover (*Charadrius melodus*) (E); and eastern massassauga (*Sistrurus catenatus catenatus*) (C). Indiana bats utilize limestone caves for winter hibernation. Females and juveniles forage in riparian and floodplain areas in the summer, whereas males over floodplain ridges and hillside forests. Piping plovers utilize open, sandy beaches, barrier islands, and sand spits formed by wave action along the lake shoreline. They do not inhabit lakeshore areas where high bluffs have replaced beach habitat, but rather prefer sparsely vegetated sand, gravel, or cobble for a nest site and forage along the shore's debris line where invertebrates are most readily available. Eastern massassauga colonies still persist in bogs, swamps, and wet prairies within glaciated Ohio but few inhabit Lake Erie marshes.

3.19.5 Species of Concern - Coordination with the U.S. Fish and Wildlife Service and Ohio Department of Natural Resources has indicated no species of special concern within the study area.

3.20 Floodplains - The 100 year floodplain along the lower portion of the Black River and Lake Erie is constricted by steep banks and bluffs and channel and shoreline modifications.

3.21 Wetlands - The National Wetlands Inventory identifies several wetlands within the study area including artificial substrates of the existing Federal harbor structures, nearshore areas west of the harbor, and streambanks on the Black River. In addition, CDFs often produce intermittent wetlands during the filling process. As the CDF is gradually filled with dredged material, the ponded water is replaced with sediment creating small wetlands. The wetlands are temporary and as the CDF is filled, the temporary wetland within the CDF changes to upland. The classification definitions of the identified wetlands in the project area are derived from Cowardin *et al.* (1979) and are provided below:

- Artificial substrates of the existing Federal harbor structures (L2RSWr): (L) Lacustrine, (2) Littoral, (RS) Rocky Shore, (W) Intermittently Flooded/Temporary, (r) Artificial Substrate;
- Lake Erie nearshore zone west of the harbor (L2OWZ): (L) Lacustrine, (2) Littoral, (OW) Open Water/Unknown Bottom (obs), (Z) Intermittently Exposed/Permanent;
- Black River channel streambanks (POWZ): (P) Palustrine, (OW) Open Water/Unknown Bottom (obs), (Z) Intermittently Exposed/Permanent. Two large excavated pits on the RT-2 Site are also mapped as this classification. Field delineation is required to verify these as wetland areas.

3.22 Geology and Soils - Most of the overlying soil and sediment at Lorain Harbor are derived from erosion of a narrow belt of mountains which existed along the eastern margin of North America during the Late Devonian age. The youngest surficial deposits incorporated into the Black River channel are alluvial sand and silt deposited adjacent to the banks. The material is composed of grey, silty fine sand to a brown gravelly coarse to fine sand and has relatively free drainage.

Soils along the lower Black River are classified as Chagrin silt loam. The Chagrin series consists of well-drained, nearly level soils on floodplains of larger streams. These soils formed in slightly acid, medium textured recent alluvium that washed from soils of the uplands. Due to the intensive industrial use of Lorain Harbor, the surface soil profile has been substantially altered by grading and filling. This is particularly evident at the RT-2 site which has been historically used as a slag disposal area. Above the river lowlands and at the Lake Erie shoreline east of the existing CDF, soils are classified as the Mahoning-Urban Land Complex. This complex is 50 to 70 percent of nearly level soil that has been altered as a result of grading and filling (USDA-SCS, July 1976).

3.22.1 Bedrock - Bedrock in the region consists of Paleozoic shale, siltstone, sandstone, and carbonate rock. In western Ohio, there is a broad low dome known as the Cincinnati Arch which has a north-trending axis. Bedrock in the vicinity of the structure has a gentle southeastward dip of approximately 20 feet per mile. The bedrock of the southern shoreline of Lake Erie in the Lorain area consists of shale of Upper Devonian age. West of Lorain, near Sandusky, Ohio, the Lake Erie shoreline is underlain by Silurian and

Devonian age limestone and dolomite. The Upper Devonian shale in central and eastern Ohio are composed of fine, clastic, sediments that were deposited in the western portion of the Appalachian Basin, a subsiding shallow sea trough.

3.22.2 Physiography - Lorain Harbor is located within the Lake Plain section of the Central Lowlands Province. The relief of the Erie Plain is slight, and gently rolling. It slopes to the north and is interrupted by morainic ridges, beaches, and low cliffs on the lake. The greatest relief occurs within the Black River valley and along the Lake Erie shoreline, where bluffs rise 30 to 50 feet. Drainage within the area is controlled by the Black River whose east and west branches join at Elyria, Ohio.

3.22.3 Groundwater - Ohio's aquifers can be divided into three major types of productive aquifers. These are sand and gravel, sandstone, and carbonate aquifers. Lorain County is underlain by sandstone aquifers that generally provide sufficient production for water wells; yields of three to ten gallons per minute can be produced in groundwater wells from the Berea Sandstone.

3.22.4 Prime and Unique Farmlands - The Chagrin silt loam unit is listed as prime farmland in Ohio. However, prime farmland is designated independently of current land use and it cannot be areas of water, urban, or developed land. Consequently, based on present land use at Lorain Harbor, no prime farmlands are present.

3.23 Meteorology/Climate - Within the study area, the climate is typically temperate with summer and winter temperatures moderated by the proximity to Lake Erie. Summers are moderately warm and humid and winters are reasonably cold and cloudy. Summer high temperatures exceed 90 degrees Fahrenheit on the average of 10 to 20 days per year. Winter temperatures are below zero degrees Fahrenheit generally less than five days per year. Overall, January is typically the coldest month and July is the warmest. Monthly rainfall is 2.5 to 3.5 inches. Although precipitation varies widely from year to year, the average annual rainfall in Lorain County is 34.56 inches.

3.24 Air Quality [National Ambient Air Quality Standards (NAAQS)] - The USEPA has set NAAQS for six principal pollutants, which are called "criteria pollutants". In 2005, Lorain County was designated a non-attainment area for ozone (eight-hour) and PM 2.5. The entire state is in attainment for sulfur dioxide, nitrogen dioxide, carbon monoxide and lead (USEPA AirData – County Air Quality Report, 2006).

3.25 Noise - Ambient noise levels throughout the study area are a function of land use within the harbor area including: commercial and recreational navigation facilities; industrial and commercial developments; transportation facilities (highways, roads, rail), recreational facilities (parks, marinas); and nearby residential developments. The primary sources of noise generation include stationary sources such as the steel-finishing operations at RTI, and traffic including automobiles, trucks, trains, and vessels. Daytime background noise levels vary at locations but are generally expected to range from 50 to 8 dBA. Average noise levels in close proximity to automobile and truck traffic can range from 60 to 90 dBA and are affected primarily by traffic volumes and speed.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction – This section presents the anticipated environmental effects of the plan alternatives discussed in Chapter 2 and the impacts to the existing conditions discussed in Chapter 3. Consistent with the Council on Environmental Quality's regulations implementing NEPA, environmental effects can be described as:

- Direct effects, which are caused by an action and occur at the same time and place;
- Indirect effects, which are caused by an action, but are later in time or removed in distance from the action (40 CFR 1508.8);
- Cumulative effects resulting from the incremental impact of an action when considered in combination with past, present, and reasonably foreseeable future actions, regardless of the agency or individual that undertakes such other actions.

Cumulative impacts are defined as the incremental impact of a proposed action when added to those of other past, present and reasonable foreseeable future actions, regardless of the entity carrying out such actions. Geographical boundaries for this discussion of cumulative impacts are the lower three-mile reach of the Black River, Lorain Harbor and offshore zone of Lake Erie to include the proposed CDF site and the harbor's designated open-lake placement site. Temporal boundaries established for this analysis are below.

- Past: 1978 when Lorain Harbor CDF was constructed to contain sediment dredged from the Federal navigation channels. 2002, initiation of DMMP study.
- Present: 2008, ongoing DMMP studies
- Future: 2014 through 2028, when a new disposal alternative will be operational.

Projecting the reasonable foreseeable future actions is difficult at best. Not all the actions by others that may affect the same resources as the proposal are clear. Projections of those actions must rely on judgment as to what is reasonable based on existing trends and, where available, projections from qualified sources. Reasonably foreseeable does not include unfounded or speculative projections. In this case, present and reasonably foreseeable future actions within the temporal and spatial boundaries may include:

- Continued commercial navigation
- Continued economic growth related to industrial revenue
- Continued commercial development
- Relocation of the WWTP
- Continued development and construction commensurate with the City of Lorain's Master Plan
- Change in existing land use patterns at the existing CDF
- Proposed passive recreation amenities
- Infrastructure/utilities development

- Continued application of environmental requirements such as those under the Clean Water Act
- Sustain current land use of heron rookery adjacent to brownfields restoration site
- Brownfields redevelopment will support environmental restoration of contaminated lands
- Brownfields redevelopment will preserve existing greenspace that may have otherwise been used for relocation of the WWTP
- Continue to assess feasibility of other beneficial use alternatives

Table 4.1 presents a summary of the anticipated environmental effects of the plan alternatives/measures considered in this DMMP/EIS.

Table 4.1. Summary of Environmental Effects				
Resource	Alternative 1 (Open-Lake Placement + FMP + New CDF)	Alternative 2 (FMP + Beneficial Use)	Alternative 3 (Open-Lake Placement + FMP + Beneficial Use)	Alternative 4 (No Action)
Socioeconomics	Indirect, moderate, long-term, positive effect from maintaining navigation for business and industry, employment and income. Low-income and minority populations not unduly affected.	Same as Alternative 1.	Same as Alternative 1.	Direct and indirect, major, long-term effect on employment and income, community cohesion, and community and regional growth. Direct and indirect, major, long term effect on property values and tax revenues.
Transportation	Direct and indirect, minor, short-term effect on commercial vessels. Direct, long-term positive effect to navigation.	Same as Alternative 1. Direct and indirect, minor, short-term effect; added truck traffic if sediment is trucked to RT-2.	Same as Alternative 2.	Direct and indirect, major, long-term effect on commercial navigation efficiency.

Table 4.1. Summary of Environmental Effects				
Resource	Alternative 1 (Open-Lake Placement + FMP + New CDF)	Alternative 2 (FMP + Beneficial Use)	Alternative 3 (Open-Lake Placement + FMP + Beneficial Use)	Alternative 4 (No Action)
Water Quality/Water Resources	Water Quality - Direct, minor, short-term effects primarily to increased turbidity. Direct, moderate, long-term positive effect via removal and confinement of contaminated sediments.	Water Quality - Same as Alternative 1.	Water Quality - Same as Alternative 1.	Water Quality - Direct, minor, short-term effects due primarily to re-suspension of contaminated harbor sediments into the water column.
	Wetlands - No effect.	Wetlands - Direct and indirect, moderate, long-term effect due to potential wetlands creation at RT-2 and the existing CDF during active filling.	Wetlands - Direct and indirect, moderate, long-term positive effect due to potential wetlands creation at RT-2 and the existing CDF during active filling.	Wetlands - No effect.
	Flood Plains - No effect.	Flood Plains - Minor, short-term impact at RT-2. Indirect, moderate, long-term impact due to streambank restoration.	Flood Plains - Minor, short-term impact at RT-2. Indirect, moderate, long-term positive impact due to streambank restoration.	Flood Plains - No effect.
Hazardous, Toxic, and Radioactive Waste	No effect.	Direct, moderate, long term positive effect of RT-2 restoration.	Direct, moderate, long-term positive effect of RT-2 restoration.	No effect.

Table 4.1. Summary of Environmental Effects				
Resource	Alternative 1 (Open-Lake Placement + FMP + New CDF)	Alternative 2 (FMP + Beneficial Use)	Alternative 3 (Open-Lake Placement + FMP + Beneficial Use)	Alternative 4 (No Action)
Cultural Resources	No adverse effect on known historic properties.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.
Aesthetics	Direct, minor, short-term effects on aesthetics from dredging and disposal activities. Direct, moderate, long-term effect due to increased height and presence of new CDF.	Direct, minor, short-term effects on aesthetics from dredging and disposal activities. Direct, moderate, long-term effect due to increased CDF height.	Same as Alternative 2.	No effect.
Recreation	Minor, short-term impact on recreational vessels near proposed dredging and construction activities. Extended use of existing CDF delays planned recreational development.	Same as Alternative 1. Restoration of RT-2 increases available area for development. Excavation of sediment from the CDF to RT-2 will extend use of the CDF and delay recreational development.	Same as Alternative 2.	Cessation in harbor maintenance creates unsafe conditions for recreational vessels.

Table 4.1. Summary of Environmental Effects				
Resource	Alternative 1 (Open-Lake Placement + FMP + New CDF)	Alternative 2 (FMP + Beneficial Use)	Alternative 3 (Open-Lake Placement + FMP + Beneficial Use)	Alternative 4 (No Action)
Aquatic Resources	Direct and indirect, minor, short-term effects on food sources for aquatic species during dredging and construction. Recurring smothering and mortality of benthic organisms at open-lake site. Long-term loss of 37.5 acres of aquatic habitat.	Direct and indirect, minor, short-term effect on food sources for aquatic species. No long-term effects anticipated. Potential beneficial effects from restoration of streambank habitat.	Direct and indirect, minor, short-term effect on food source for aquatic species. Recurring smothering of benthic organisms at open-lake site.	Reduced water depths in Lorain Harbor.
Terrestrial Resources	Direct and indirect, long-term, minor effects on terrestrial wildlife and habitat; CDF will create 37.5 acres of land.	Direct and indirect, short-term, minor effects on terrestrial wildlife and habitat through restoration of brownfield.	Direct and indirect, short-term, minor effects on terrestrial wildlife and habitat through restoration of brownfield.	No effect.
Endangered Species	Plants-No effect Animals-No effect.	Same as Alternative 1.	Same as Alternative 1.	No effect.

Table 4.1. Summary of Environmental Effects				
Resource	Alternative 1 (Open-Lake Placement + FMP + New CDF)	Alternative 2 (FMP + Beneficial Use)	Alternative 3 (Open-Lake Placement + FMP + Beneficial Use)	Alternative 4 (No Action)
Geology and Soils	No effect.	Direct and indirect, moderate, long-term positive effect to soils due to stabilization of RT-2.	Same as Alternative 2.	No effect.
Air Quality	Direct, minor, short-term effects to local air quality due to dredging and construction equipment operations.	Direct, minor, short-term effects to local air quality due to dredging and construction equipment operations.	Same as Alternatives 1 and 2.	No effect.
Noise	Direct, minor, short-term effects due to noise from dredging and construction equipment.	Direct, minor, short-term effects due to noise from dredging and construction equipment.	Same as Alternative 2.	No effect.
Cumulative Effects	Potential positive effects on aquatic resources from removal of contaminated sediments. Potential negative effect CDF will cause loss of 37.5 acres.	Potential positive effects on upland habitat through RT-2 restoration. Relocation of WWTP accommodates lakefront development and regional growth.	Same as Alternative 2.	Potential positive effects on aquatic habitat through the gradual decrease in harbor channel depths.

NOTE: "Impacts" and "effects" are used interchangeably. Unless otherwise noted as beneficial or positive, impacts described are negative.

4.2 Socioeconomics – Lorain is an important Great Lakes city. Because of its’ location and transportation facilities, it has become an important local, State, Regional, National, and World center of industry and commerce.

4.3 Community/Regional Growth:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: The maintenance of a viable commercial harbor at Lorain would preserve the areas potential for desirable community and regional growth for the twenty year period of analysis.

b. FMP: By extending the life of the existing CDF through the year 2014, implementation of the City of Lorain CDF Master Plan for recreational development may be delayed.

c. New CDF: The maintenance of a viable commercial harbor at Lorain would preserve the areas potential for desirable community and regional growth for the twenty year period of analysis.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to community and regional growth for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: The restoration of RT-2 and planned construction of the Black River WWTP would accommodate desirable community and regional growth.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to community and regional growth for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to community and regional growth for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to community and regional growth for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). If authorized channels depths are not maintained at Lorain Harbor, the commercial viability of the harbor will be significantly affected and desirable community and regional growth would be seriously impaired.

4.4 Employment and Income:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF). Effect to employment and income for each of the measures in Alternative Plan 1 would be similar; the proposed maintenance and construction activities would result in a minor, short-term increase in employment opportunities, specifically in the marine construction trades. The maintenance of a navigable harbor would help preserve employment opportunities associated harbor industries. Project construction would provide business, industry, employment, and income to construction, supply and service industries during the construction period.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material). The effects to employment and income for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material). The effects to community and regional growth for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

Alternative Plan 4 (No Federal Action). If Federal navigation channels are not maintained, both business and industry would be seriously affected and related employment and income could be reduced.

4.5 Environmental Justice:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF). Environmental justice impacts for each of the measure in Alternative Plan 1 would be similar; harbor maintenance activities would result in no adverse effects on predominantly minority or low income populations. Construction of a new CDF at Lorain Harbor would provide job opportunities in the construction, supply, and service industries during the construction period.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material). The effects to environmental justice for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material). The effects to environmental justice for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

Alternative Plan 4 (No Federal Action). If Federal harbor navigation facilities were not maintained, both commercial and recreational navigation and associated businesses would be adversely affected. Associated business, industry, employment, and income could be reduced.

4.6 Community Cohesion:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF). The effect to community cohesion for each of the measures in Alternative Plan 1 would be similar; maintenance of the Federal channels at Lorain Harbor would preserve its viability as a commercial navigation and importance to the local economy. A sound local economy contributes to community cohesion by preserving employment opportunities and avoiding the need for local residents to relocate.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material). The effects to community cohesion for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material). The effects to community cohesion for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

Alternative Plan 4 (No Federal Action). If Federal maintenance of Lorain Harbor is suspended, commercial navigation and associated businesses would be adversely affected thus potentially reducing or eliminating some local employment opportunities. Some individuals and families would be forced to relocate to other areas for employment and thus reduce community cohesion and contribute towards social fragmentation.

4.7 Property Values/Tax Revenues:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-Lake Placement: Channel dredging would maintain the navigability of Lorain Harbor thereby protecting the value of existing commercial facilities that depend on the harbor for the transportation of raw materials and finished products. The maintenance of a viable commercial harbor would serve to preserve tax revenues from industries that operate at the harbor.

b. FMP: Extending the useful life of the existing CDF would allow for continued maintenance dredging of the harbor, thereby protecting the value of existing commercial facilities that depend on the harbor for the transportation of raw materials and finished products. The maintenance of a viable commercial harbor would serve to preserve tax revenues from industries that operate at the harbor.

c. New CDF: The proposed construction of a new CDF would have no effect on values or tax revenues.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to property value/tax revenues for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: Although the restoration of RT-2 would increase the value of the property, the land is expected to remain in public ownership and therefore changes to tax revenues are not anticipated.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to property value/tax revenues for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to property value/tax revenues for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to property value/tax revenues for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). The cessation of harbor maintenance is expected to result in adverse effects on the value of industrial properties that depend on the harbor. The devaluation of these properties would result in a concomitant decrease in tax revenues.

4.8 Public Services and Facilities:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: Harbor dredging and the placement of dredged material at the existing open-lake site would have no effect on the City of Lorain public water intake (located 4.25 miles to the south) or the public water supply.

b. FMP: There would be no adverse impact on public services or facilities if use of the existing CDF is continued through 2014 or if a new in-water CDF is constructed.

c. New CDF: No effect.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to public services and facilities for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: The use of dredged material in the reclamation of RT-2 would have a direct, long-term beneficial effect on public services

and facilities. The site would be prepared for the relocation of the Black River WWTP and provide sufficient area for potential future expansion to address the sewage treatment needs of the Lorain area.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to public services and facilities for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to public services and facilities for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to public services and facilities for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). No effect.

4.9 Land Use:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: Maintenance dredging, open-lake placement of dredged material, and construction of a CDF would have no effects on land use.

b. FMP: Implementation of the FMP would not result in any changes to land uses within the harbor. Raising the berms at the existing CDF would continue use of the facility through 2014 and extend its effects on adjacent commercial and recreational land uses. Extended use of the CDF would delay the implementation of the City of Lorain CDF Master Plan.

c. New CDF: Construction of a new CDF would have no effects to current land use.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to land use for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: The use of dredged material for restoration of RT-2 would facilitate converting a brownfield into an acceptable property for relocation of the Black River WWTP.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to land use for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to land use for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to land use for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). If Federal navigation channels are no longer maintained, industrial land use at Lorain Harbor is expected to diminish.

4.10 Business and Industry

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: The maintenance of authorized channel depths would insure uninterrupted deliveries and shipments for harbor users and support existing business and industrial activity. The temporary presence of dredging and construction equipment would not interfere with normal commercial shipping operations. During harbor maintenance and construction activities, the presence of work crews would result in minor, short-term increase in commercial activity.

b. FMP: This alternative would allow for continued removal of contaminated sediments from the river and harbor channels, support commercial navigation that supplies materials necessary for continued operations of many waterfront industries.

c. New CDF: The construction of a new CDF along the Outer Breakwater would be sited to minimize obstructions for commercial vessels entering or leaving the harbor.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to business and industry for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: The use of dredged material at RT-2 would not interfere with steel-finishing operations at the adjacent REP plant.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to business and industry for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to business and industry for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to business and industry for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). If authorized depths in the Federal channels are not maintained, available channel depths would continue to decrease. Commercial vessels would need to be light loaded over the 20 year evaluation period, causing an increase in raw material products to harbor end users.

4.11 Transportation:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: Vessels navigating in the vicinity of the project area would be required to temporarily avoid the dredging and open-lake placement areas. Maintenance of the Federal navigation channel would ensure the continued use of Lorain Harbor as a navigable transportation route for commercial vessels.

b. FMP: The construction of interior berms within the existing CDF would necessitate the movement of construction equipment (e.g., front-end loader, bulldozer) to the site. This would be a minor, short-term disruption to vehicular traffic using Lakeside Avenue and adjacent parking areas.

c. New CDF: Since construction materials for a new CDF would be transported via barge to the site, some minor, short-term disruption to commercial and vessel traffic may occur. The contractor may also need to establish a temporary staging area for construction materials at Lorain Harbor. Delivery of these materials to the staging area would also result in minor, short-term disruptions to local transportation routes.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to transportation for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: It is anticipated that dredged material would be hydraulically pumped from the upstream limits of the dredging area to RT-2. However, if material is excavated from the existing CDF and trucked to RT-2, significant truck traffic would be generated along several major roads within the city. Annual transportation of 75,000 cubic yards of dredged material would generate approximately 7,500 truck movements.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to transportation for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to transportation for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to transportation for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). The cessation of Federal maintenance dredging at Lorain Harbor would seriously impede the transportation of raw materials and finished products. As channel depths decrease due to persistent shoaling, harbor users would be forced to light load their vessels in order to navigate the channels. Decreased load size would result in a greater number of individual trips through the harbor.

4.12 Health and Safety:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF). The removal of shoals within the Federal navigation channels during normal dredging operations would maintain safe access for deep-draft commercial vessels.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material). The effects to health and safety for each measure in Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material). The effects to health and safety for each measure in Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

Alternative Plan 4 (No Federal Action). If Federal navigation channels are not regularly maintained, decreased depths may create unsafe conditions for deep-draft vessels. These impaired navigation conditions could result in an increase in the potential for vessel grounding.

4.13 Water Quality/Water Resources:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: Elutriate testing conducted on harbor sediments from Management Units LRB-1 and LRB-2 in 2005 and 2006 has concluded that only low

levels of some metals and nutrients would be released into the water column during open-lake placement operations. No releases of PAHs, PCBs or pesticides were detected. Short-term impacts on water quality would include a temporary increase in turbidity and the possibility of accidental spills of fuel, oil and/or grease into the water during dredging and discharge activities. The dredging and construction contractors would be required to prepare a spill control plan and to implement appropriate measures in the event of a release. Any such releases are expected to be short-term and minor.

b. FMP: Managing the existing CDFs at Lorain would entail vertical expansion within the original design footprint. A Contractor would grade the sediments in the CDF to raise the elevation of the perimeter to increase capacity. Managing the CDF through implementation of a FMP would increase the capacity and useful life of the facility would be extended. This alternative would allow for continued removal of contaminated sediments from the river and harbor channels, support commercial navigation that supplies materials necessary for continued operations of many waterfront industries, and promote the potential for fish spawning activities via a cleaner river. Transitory wetlands would be created during the actual filling and management of the CDF.

c. New CDF: This alternative includes the construction of a minimum twenty year CDF that would allow for continued annual operations and maintenance dredging of the river and harbor channels. Continued dredging would benefit the water resources in many ways including: continued removal of contaminated sediments, support commercial navigation that supplies materials necessary for continued operation of many waterfront industries, and promote fish spawning activities via a cleaner river and with manmade habitat structures expected to be incorporated on the exterior perimeter of the new 37.5 acre facility. Although there would be increased turbidity and noise in and around the construction area that would cause fish and other aquatic species to avoid the project area, they would quickly return to the area once construction is complete. Commercial and recreational vessels would have limited use of the waterway immediately adjacent to the construction site in an effort to protect mariners. The negative impacts to the area would be minimal and limited to the construction period; overall impacts to the waterway as a local and regional resource would be beneficial and long term. Transitory wetlands would be created during the active filling and management of the CDF.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to water quality and water resources for Alternative Plan 2 would be similar to the above proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: Leaching of constituents from the dredged material to groundwater or surface water would most likely not result in unacceptable concentrations or significant lowering of water quality. The City of Lorain will have remediated the RT-2 Site under the Ohio Voluntary Action Program prior to the placement of any dredged material at the site. The placement of saturated dredged material at the site would not mobilize residual subsurface contaminants above levels that

are currently experienced at the non-remediated, uncontrolled site during normal precipitation and percolation. Ecological impacts would be minimal. Transitory wetlands could be created during the actual filling and management of the RT-2 site.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to water quality and water resources for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to water quality and water resources for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to water quality and water resources for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). This alternative involves no construction or filling operations and there would be no plan for future long-term placement of dredged material. Federal dredging and disposal operations in Lorain Harbor would cease and the navigation channels would progressively shoal in. The harbor would continue to be used for recreation and commercial navigation, but with reduced channel depths. Annual revenue related to fishing, travel, and tourism may slowly decline. The loss of the valuable water resource would cause negative regional impacts. State and Federal laws may remain in place to prevent further pollution and contamination within the river and harbor; however failure to remove existing contaminated sediments would negatively impact the water resource.

4.14 Hazardous, Toxic, and Radioactive Wastes (HTRW):

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).
No effects in relation to HTRW are anticipated for the measures included in Alternative Plan 1.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: No effect.

b. Beneficial Use of Dredged Material: A geomembrane or composite liner at RT-2 may be used to prevent water from percolating out of the dredged material into site soils. This would be a short-term, moderate impact since the final two-foot layer of dredged material/sewage sludge would provide an effective cover for the site to meet the Ohio VAP industrial use criteria for the protection of human health. The geomembrane or liner in conjunction with a two foot cover may also reduce the potential movement of on-site contaminants via leaching.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to HTRW for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to HTRW for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to HTRW for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). This alternative involves no construction or filling operations and there would be no plan for future long-term placement of dredged material. Federal dredging and disposal operations in Lorain Harbor would cease and the navigation channels would progressively shoal in. Since dredged material is expected to be used for brownfield restoration at RT-2, it is likely the property will not be restored and developed. This would negatively impact the City of Lorain's ability to relocate the WWTP.

4.15 Sediment Quality:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: The biennial dredging of bottom sediments from Lorain Harbor would result in a gradual improvement in sediment quality in the Outer Harbor and Black River Channel. As the point and non-point sources of pollution are reduced, the quality of new sediments deposited in the harbor will contribute to this improvement. The placement of harbor sediments at the designated open-lake site would add a greater proportion of fine-grain material to the site. With a sand component ranging from 2.1 to 47.6 percent, the River Channel sediments placed at the open-lake site would add more silts and clays to the site that currently contains 75-4 to 81.9 percent sand. Since contaminant levels of sediments at the open-lake site are generally higher than those of the sediments to be dredged from Management Units LRB-1 and LRB-2, a slight improvement in sediment quality at the open-lake placement site is anticipated.

b. FMP: No effect.

c. New CDF: At the new CDF site, a predominantly sandy lake bottom would be replaced by large stone used to construct the perimeter dike. The lake bottom that would be contained by the facility would gradually be replaced by the recurring placement of fine-grain sediments to be dredged from Management Unit LRB 3.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: No effect.

b. Beneficial Use of Dredged Material: No effect.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to sediment quality for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to sediment quality for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to sediment quality for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). This alternative involves no construction or filling operations and there would be no plan for future long-term placement of dredged material. Federal dredging and disposal operations in Lorain Harbor would cease and the navigation channels would progressively shoal in. The harbor would continue to be used for recreation and commercial navigation, but with reduced channel depths. Annual revenue related to fishing, travel, and tourism may slowly decline. The loss of the valuable water resource would cause negative regional impacts. State and Federal laws may remain in place to prevent further pollution and contamination within the river and harbor; however failure to remove existing contaminated sediments would negatively impact the water resource.

4.16 Cultural Resources:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: Since maintenance dredging would be limited to existing navigation channels, no historic properties are expected to be affected. The open lake placement site was last used in 1977 and there are no records of any shipwrecks at this site. Dredged material placed at the site would effectively cap any previously unrecorded sites in-situ and would have no adverse effect.

b. FMP: Since the construction of interior berms within the existing CDF would use in-place dredged material at a site that was heavily disturbed by its original construction in 1978, no adverse effects on historic properties would result. Also, the proposed berms would not adversely affect the views of the Lorain Lighthouse.

c. New CDF: Construction of a new CDF would be subject to site-specific NHPA Section 106 review. Unknown historic properties could be affected by construction

activities. To date, no historic properties have been identified along the Outer Breakwater and therefore no adverse effect is expected.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effect to cultural resources for Alternative Plan 2 would be similar to the above for proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: Extensive use of RT-2 for industrial development and slag disposal has thoroughly disturbed the entire surface and subsurface. No historic properties associated with the site have been identified and no adverse effects are anticipated.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to cultural resources for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to cultural resources for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to cultural resources for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). No effect.

4.17 Aesthetics:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: The presence of dredging equipment would temporarily detract from the local aesthetic quality of the Black River and Lake Erie. Dredging and discharge activities would temporarily increase turbidity levels within Lorain Harbor and at the open-lake placement site. The re-suspension of fine grain particles in the water column would result in a short term reduction in water clarity and alteration in water color. Local wind patterns and river and lake currents would dissipate these effects before any widespread areas are affected. The atmospheric exposure of organic matter that may be contained in the dredged material may result in short-term, localized malodor.

b. FMP: Fill management within the existing CDF would involve the presence of construction equipment which would temporarily detract from the aesthetics quality of the area. Raising berms within the CDF is not anticipated to significantly obstruct the

view of Lake Erie from the shoreline nor have a negative effect on the aesthetic quality of the site.

c. New CDF: The presence of construction equipment during construction of the new CDF would temporarily detract from the aesthetic quality of the area. Construction of a new CDF would add an additional man-made feature at Lorain Harbor and adjacent Lake Erie. This facility would permanently alter existing views of the lake in the project vicinity. Construction and operation of a new CDF immediately adjacent to Spitzer Marina would be aesthetically displeasing to recreational boaters who use the marina.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effect to aesthetics for Alternative Plan 2 would be similar to the above for proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: Use of dredged material to restore RT-2 would have a long-term positive effect on the current aesthetic qualities of the former industrial site.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to aesthetics for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to aesthetics for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to aesthetics for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). If the Federal harbor navigation facilities were not maintained, over time businesses would incur increased raw material costs, and some could either close and/or relocate. The abandoned buildings and infrastructure would likely be neglected and fall into disrepair. In addition dredged material is expected to be used for brownfield restoration at RT-2; it is likely the property will not be restored and developed. This would negatively impact the City of Lorain's ability to relocate the WWTP and would result in an indirect, long term, negative effect on the waterfront aesthetics. .

4.18 Recreation:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: Normal channel dredging operations, including the open-lake placement of dredged material, generally have no significant adverse effects on recreation resources. The open lake placement site is located 3.4 miles north of the harbor; recreation boaters typically remain within the protected breakwater structure or closer to shore in unprotected areas. During placement activities, the open lake site is marked with buoys and orange caution flags to alert boaters to temporarily avoid the area. Therefore, open lake placement is not expected to affect harbor recreation users.

b. FMP: Extending the life of the existing CDF would delay implementation of the City of Lorain CDF Master Plan.

c. New CDF: Construction of a new CDF would result in the loss of approximately 37.5 acres of open Lake Erie water that is currently available for water based recreation such as boating and fishing. During its various stages of filling the new facility could be used by local interests for hunting, fishing, bird-watching, and passive recreation however, it would only be accessible by boat.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effect to recreation for Alternative Plan 2 would be similar to the above for proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: Since RT-2 is located within a predominantly industrialized area that is not publicly accessible, the placement of dredged material at this site would not result in any adverse impacts to recreation resources. No recreational development is planned at this site.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to recreation for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to recreation for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to recreation for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). The cessation of maintenance dredging of Federal navigation channels would result in a long-term, moderate adverse effect on recreational navigation. Gradual siltation of the harbor channels would reduce navigable depths for certain recreation craft, particularly sail boats and larger commercial recreation vessels. The current CDF would likely be transferred to the local sponsor and developed in concert with the City of Lorain CDF Master Plan.

4.19 Aquatic Resources:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: Physical impacts attributable to open-lake placement activities would directly result in the destruction of immobile and sedentary benthic species residing in bottom sediments along the Federal channels and at the open-lake site. Only the southern two thirds of the 640 acre open lake site will be impacted. The physical grain size characteristics of the bottom habitat at the site would be altered with the addition of material with a greater percentage of silt and clay size particles. Chemical analysis of the bottom sediments conducted in 2005 and 2006 indicated that the Outer Harbor sediments and Black River Channel sediments, approximately 1,300 feet upstream of River Mile 2, were less contaminated than those sediments at the open-lake placement site. Consequently, the placement of dredged material at the site would be expected to slightly improve the chemical quality of the in-place sediments.

Both the dredged channel bottom and lake bottom at the placement site would be rapidly re-colonized by organisms living in the dredged material and those occupying nearby areas. Chemical bioassays conducted on the sediments in 2005 and 2006 concluded that the toxicological effects of contaminants associated with the dredged material would not be significant. The physical effects of short-term turbidity increases may cause some plankton mortality in the overlying water column. Dredging and discharge activities would cause local fish species to temporarily avoid the project area, however significant adverse impacts on spawning, nursery, and feeding activities of local fish species are not anticipated.

A slight improvement in the chemical quality of benthic habitat at the open-lake placement site may result in a minor benefit to the local fish community. The re-suspension of organic matter associated with the dredged material may in fact act as a short-term attractant to some fish species.

b. FMP: The construction of interior berms within the existing CDF would not affect any aquatic resources.

c. New CDF: CDF construction would result in the direct, long-term loss of 37.5 acres of aquatic habitat. Submerged portions of armor stone along the Outer Breakwater would be replaced with the rocky substrate of the perimeter dike of the proposed CDF. During the construction of the new CDF, man-made fish habitats would be placed along various portions of the perimeter.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effect to aquatic resources for Alternative Plan 2 would be similar to the above for proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: No effect.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to aquatic resources for Alternative Plan 3 would be similar to the above proposed Alternative Plan 1.

b. FMP: The effects to aquatic resources for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to aquatic resources for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). The cessation of Federal dredging activities at Lorain Harbor would result in the gradual accumulation of bottom sediments within the Outer Harbor and lower portion of the Black River. Water depths would decrease and submerged vegetation would become established in shoal areas.

4.20 Terrestrial Resources:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: Local wildlife, particularly gulls, terns and waterfowl, would temporarily avoid the harbor and open-lake placement site during the dredging and discharge operations, but would return quickly after the activities cease. The re-suspension of organic matter associated with the dredged material may also act as a short-term attractant to certain species of waterfowl.

b. FMP: Managing the existing CDF at Lorain would entail vertical expansion within the original design footprint. A Contractor would grade the sediments in the CDF to raise the elevation of the perimeter to increase capacity. Managing the CDF through implementation of a FMP would increase the capacity and useful life of the facility would be extended. Since the existing CDF is still utilized, there is minimal to moderate existing vegetation and therefore impacts to vegetation on the existing CDF would be minor. When the existing CDF is at full capacity, herbaceous and woody vegetation would spread rapidly.

c. New CDF: Construction of a new CDF would eventually create approximately 37.5 acres of new upland habitat. Initially, this would be limited to perimeter stone rubblemound that would be used by waterfowl for resting and nesting.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to terrestrial resources for Alternative Plan 2 would be similar to the above proposed Alternative Plans 1.

b. Beneficial Use of Dredged Material: The placement of dredged material at RT-2 would result in the short-term disruption of low-value upland habitat. Approximately forty acres of this current habitat would be lost by the construction of the new Black River WWTP. The placement of dredged material at the site would provide the preliminary basis for brownfield restoration. Since a significant great blue heron rookery is located along the left streambank adjacent to RT-2, no construction would be performed between March 15 and May 31 in order to avoid disruptions to the birds breeding and nesting season. A 100 yard buffer will be placed between the rookery and any dredging and disposal operations (ODNR).

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to terrestrial resources for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1.

b. FMP: The effects to terrestrial resources for Alternative Plan 3 would be similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to terrestrial resources for Alternative Plan 3 would be similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). No effect.

4.21 Threatened and Endangered Species

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF).

a. Open-lake Placement: Although the open-lake site is within the range of the Indiana bat, piping plover, and Mississauga bat, placement of dredged material is not expected to have an effect on these species.

b. FMP: Although the existing CDF is within the range of the Indiana bat, piping plover, and Mississauga bat, the management of the existing CDFs is not expected to have an effect on these species.

c. New CDF: Although the proposed location of the new CDF is within the range of the Indiana bat, piping plover, and Mississauga bat it is not expected that the project will have any effect on these species.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to threatened and endangered species of Alternative Plan 2 are similar to the above proposed Alternative Plan 1.

b. Beneficial Use of Dredged Material: Although RT-2 is within the range of the Indiana bat, piping plover, and Mississauga bat it is not expected that the project will have any effect on these species.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material).

a. Open-lake Placement: The effects to threatened and endangered species of Alternative Plan 3 are similar to the above proposed Alternative Plan 1.

b. FMP: The effects to threatened and endangered species of Alternative Plan 3 are similar to the above proposed Alternative Plans 1 and 2.

c. Beneficial Use of Dredged Material: The effects to threatened and endangered species of Alternative Plan 3 are similar to the above proposed Alternative Plan 2.

Alternative Plan 4 (No Federal Action). No effect.

4.22 Geology/Soils:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF). Each measure in alternative plan 1 is not anticipated to significantly affect the geology and soils.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material).

a. FMP: The effects to geology and soils of Alternative Plan 2 are similar to the above proposed Alternative Plans 1.

b. Beneficial Use of Dredged Material: The use of dredged material at the RT-2 Site would help restore a productive soil profile at this former industrial site.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material). This alternative is not anticipated to significantly affect the geology and soils similar to Alternative Plans 1 and 2.

Alternative Plan 4 (No Federal Action). No effect.

4.23 Air Quality:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF). The operation of dredging and construction equipment would result in a slight increase in

emissions of pollutants (particulate matter, nitrogen dioxide, carbon monoxide) into the local atmosphere, however the proposed project would not result in emissions above *de minimis* thresholds as established by Federal General Conformity Regulations for all measures in Alternative Plan 1.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material). This alternative is not anticipated to significantly affect the air quality similar to Alternative Plan 1.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material). This alternative is not anticipated to significantly affect the air quality similar to Alternative Plans 1 and 2.

Alternative Plan 4 (No Federal Action). No effect.

4.24 Noise:

Alternative Plan 1 (Open-lake Placement, Fill Management Plan, New CDF). Dredging and construction activities would result in a short-term increase in local noise sources. Noise sources would include vessel engines, compressors, winch engines, and/or hydraulic pumps. Generally, energy-equivalent noise levels at public works construction sites range from 75 to 89 dBA (A-weighted decibels). Noise generated from a typical hydraulic dredging operation range from 60 to 80 dBA. For comparative purposes, the single vehicle noise output of a heavy truck ranges from 80 to 90 dBA and the peak noise level of a loud motorcycle at 20 feet is 110 dBA (Canter, 1996). For the purposes of this evaluation, adjacent land uses have been used to estimate noise levels and potential impact on ambient conditions at the project site. Since the dredging and construction area is located within a commercial and industrial setting, the operation of dredging equipment would have minimal impacts on local receptors. Noise generated would have most of its effect on parties in close proximity to the harbor area.

Alternative Plan 2 (Fill Management Plan, Beneficial Use of Dredged Material). This alternative is not anticipated to significantly affect noise impacts similar to Alternative Plan 1.

Alternative Plan 3 (Open-lake Placement, Fill Management Plan, Beneficial Use of Dredged Material). This alternative is not anticipated to significantly affect noise impacts similar to Alternative Plans 1 and 2.

Alternative Plan 4 (No Federal Action). No effect.

4.25 Cumulative Impacts: Consideration of cumulative effects requires a broader perspective than examining just the direct and indirect effects of a proposed action. It requires that reasonably foreseeable future impacts be assessed in the context of past and present effects to each important resource. One of the most important aspects of

cumulative effects assessment is that it requires consideration of how actions by others (including those action completely unrelated to the proposed action) have and will affect the same resources. Upon considering the spatial and temporal boundaries along with the identified past, present and reasonably foreseeable future actions, the following resources that are impacted by the proposed preferred alternative plan could potentially undergo cumulative impacts.

- Socioeconomics: In general, positive community and regional growth effects are expected to result from the continued Federal maintenance of Lorain Harbor. Positive future changes to employment and income, passive recreation amenities, and public facilities are anticipated to result from the DMMP alternatives that are consistent with the City of Lorain's Master Plan.
- Transportation: Each of the action alternatives would result in continued commercial navigation at Lorain Harbor.
- Health and Safety: The relocation of the WWTP to the RT-2 brownfields would be scaled to meet the projected future wastewater treatment needs for the city of Lorain.
- Water Quality and Water Resources: Continued dredging would benefit the water quality through continued removal of contaminated sediments and water resources by supporting commercial navigation. Brownfield restoration of RT-2, including land cover and implementation of buffers along the river bank would likely minimize sediment loads into the river from RT-2.
- HTRW: Brownfields restoration at RT-2 would support environmental restoration of contaminated lands and reduce the migration of contaminants to groundwater and surface water.
- Sediment Quality: Removal of harbor sediments during dredging operations would gradually improve sediment quality within Lorain Harbor.
- Aesthetics: Transfer of the existing CDF, and brownfields restoration at RT-2 would allow for continued development and construction commensurate with the City of Lorain's Master Plan for future shoreline development and relocation of the WWTP. The brownfield restoration area will facilitate local plans to restore a more natural setting to the site.
- Recreation: Transfer of the existing CDF to the local sponsor would allow for continued development and construction commensurate with the City of Lorain's Master Plan.
- Aquatic Resources: Benthos and phytoplankton would be destroyed during dredging operations and recolonize after operations are complete. Fish will

temporarily avoid the project area during dredging operations. It is anticipated that the placement of progressively less contaminated sediment over the relatively more contaminated bottom sediments at the open-lake site would gradually help improve the quality of habitat.

- Terrestrial Resources: Transfer of the existing CDF to the local sponsor may provide an opportunity for the area to become naturally vegetated. Colonization of upland plants will provide food, nesting, and cover that will attract terrestrial wildlife. However, this may result in uptake of contaminants through the food chain. Once the new CDF is filled to capacity it would likely vegetate and become viable habitat for various terrestrial resources.
- Geology and Soils: The placement of a two foot cover of dredged material and sludge mixture at RT-2 would help reduce the percolation of precipitation and surface water to residual slag deposits at the site.
- Air Quality: Construction of the new Black River WWTP would introduce a new stationary source for minor, long-term emissions of odors, criteria pollutants (e.g., nitrogen dioxide), and volatile organic compounds. At present, there are no sensitive receptors at the RT-2 Site; however, adjacent areas may be developed as passive recreation areas.

4.26 Measures to Minimize Environmental Impacts: The alternatives presented were developed to support disposal of sediments removed from the Harbor and River Channels during biennial O&M dredging activities. The following measures to minimize environmental impacts during dredging and disposal activities include:

- Dredging would not be performed during Lake Erie storm events.
- Care would be employed throughout the course of the dredging and disposal operations to avoid the creation of unnecessary turbidity that may degrade water quality or adversely affect aquatic life outside the project area.
- The contractor would be required to keep their activities under surveillance, management and control to minimize interference with, disturbance to and damage of local fish and wildlife.
- Effluent from CDF weir will be monitored to achieve discharges of 100 ppm total suspended solids.
- Dredging and construction contractors would be required to use methods and devices to control noise emitted by their equipment.

4.27 Measures to Offset Unavoidable Impacts: Various BMPs would be implemented as mitigation techniques during the design, construction, and operation phases of the selected alternative plan(s). The potential measures include:

- Man-made fish habitat would be installed along the perimeter of newly constructed CDFs.
- Toe stone would be placed along the base of the CDF to promote macroinvertebrate and other aquatic habitat including spawning activities.

- Contractors would be required to develop an Environmental Protection Plan to include, but not limited to, noise control, minimize turbidity, develop and implement spill prevention control and countermeasures, and reduce air emissions.
- No in water activity shall occur prior to June 15 in order to minimize impacts on the aquatic ecosystem, specifically warmwater fish spawning activities
- To minimize impacts to the Great Blue Heron, no construction would be performed between March 1 and May 31 in order to avoid disruptions to the birds breeding and nesting season.
- An appropriate buffer, in both time and distance, would need to be maintained to avoid disturbance to a locally significant great blue heron rookery located adjacent to the site
- Providing capacity for dredged material in existing CDFs and new facilities would remove contaminated sediment from the navigation channels.
 - This maintains adequate depths for commercial navigation and sustains the economic vitality of the community and region.
 - Supports Lorain River RAP restoration activities by restoring the environmental quality of Black River through the remediation of existing conditions.
 - Provides cleaner waters for aquatic habitat.
 - Increases opportunities for recreation boating, fishing, and swimming.
 - Once filling operations are complete and the existing CDF is transferred to the local sponsor, the end land use could support recreation development to support community cohesion and growth while adding to the lakefront aesthetics.

5.0 – ENVIRONMENTAL COMPLIANCE

5.1 Introduction - Throughout the planning/scoping and NEPA process for the Lorain Harbor DMMP/EIS stakeholders and interested parties will be invited to identify issues and provide comments on the alternatives developed. Numerous Federal, State and local laws, statutes, executive orders, regulations and guidelines exist and must be considered during the planning, coordination, assessment/evaluation and ultimate selection of a plan for dredged material management at Lorain. Actions have been initiated to integrate the requirements of the following items into the Lorain DMMP process. The DMMP/EIS addresses the potential social, economic, and environmental benefits and adverse impacts that would result from each alternative plan selected for detailed analysis.

5.2 National Environmental Policy Act (NEPA) - In accordance with the Council on Environmental Quality's "Regulations for Implementing the Procedural Provisions of the NEPA of 1969" (40 CFR 1500-1508) and Engineer Regulation 200-2-2 (Procedures for Implementing NEPA), the Buffalo District will assess the significant environmental impacts of the alternatives and the tentatively selected plan in a draft and final EIS which is integrated into one volume with the DMMP.

A public meeting was held in Lorain, Ohio on 22 May 2003 for the purposes of both NEPA scoping and Plan Formulation. It was well attended and covered by the local newspaper. In addition, a "Public Scoping Information Packet" dated April 11, 2005 (App E) for the Lorain DMMP/EIS was given widespread dissemination to agencies and the public. The Notice of "Intent to Prepare a Draft Environmental Impact Statement for a Proposed Dredged Material Management Plan for Lorain Harbor, OH" was published in the *Federal Register* on March 6, 2007 (App E). Comment letters received to date on the Scoping Information Packet and Notice of Intent to Prepare an EIS have been summarized in Chapter 6.

5.3 Clean Water Act - For the tentatively selected plan, the City of Lorain will be required to obtain all necessary environmental permits. In accordance with Section 404(e) of the Act, the discharge of return water from an upland contained dredged material disposal area into waters of the United States is authorized under Nationwide Permit (NWP) 16. No public notice is required, but these discharges would be subject to the general conditions of NWP 16. On July 6, 2007, the Ohio Environmental Protection Agency granted Section 401 Water Quality Certification for NWP 16. Under Section 402 of the Act, the City of Lorain would be required to develop a Stormwater Pollution Prevention Plan for construction activities that disturb one acre or greater and submit it along with a Notice of Intent application to OEPA for coverage under General Permit (OHC000002).

5.4 Fish and Wildlife Coordination Act and Endangered Species Act - Initial compliance with these acts has been accomplished by initial scoping and subsequent related coordination with the U.S. Fish and Wildlife Service (USFWS). The USFWS completed a Fish and Wildlife Coordination Act Report on August 17, 2007 and submitted it to the USACE for consideration and inclusion with the Environmental

Impact Statement (Appendix J). It includes resource information, assessment and evaluation of impacts of detailed alternatives, endangered species consultation, and associated comments and recommendations.

5.5 Coastal Zone Management Act - If the ultimately selected plan affects Ohio's designated coastal zone, the USACE, Buffalo District will prepare a Federal Consistency Determination for the selected plan, coordinate the CZM determination with the Ohio Department of Natural Resources, and request their concurrence with the determination.

5.6 National Historic Preservation Act - Section 106 consultation was initiated with the distribution of the Scoping Information Packet with the State Historic Preservation Office (Ohio Historical Society), potentially interested Indian tribes, historic preservation organizations and others likely to have knowledge of, or concern with, historic properties that may be present within the area of potential effect. The ultimately selected plan will be coordinated in greater detail when the draft EIS is distributed for public comment and more site-specific information is available.

5.7 Clean Air Act - Project coordination was initiated through the Scoping Information Packet with the USEPA. No significant adverse impacts to air quality would be expected due to project implementation. Copies of the draft EIS will be sent to the Regional Administrator of the USEPA requesting comments in compliance with the Clean Air Act. Established under the Clean Air Act, Section 176(c)(4), the General Conformity Rule plays an important role in helping states and tribal regions improve air quality in those areas that do not meet the National Ambient Air Quality Standards (NAAQS). Under the General Conformity Rule, federal agencies must work with State, Tribal and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the initiatives established in the applicable state or tribal implementation plan.

5.8 Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994; Executive Order 12948, Amendment to Executive Order 12898, January, 30, 1995. The proposed dredging and placement operations would not result in disproportionately high or adverse human health or environmental effects on minority or low-income populations.

5.9 Migratory Bird Treat Act of 1918 – The Migratory Bird Treat Act decreed that all migratory birds and their parts (including eggs, nests, and feathers) were fully protected. This act is the domestic law that affirms, or implements, the United States' commitment to four international conventions (with Canada, Japan, Mexico, and Russia) for the protection of a shared migratory bird resource. The Great Blue Heron is listed on the Migratory Bird List. Therefore, this Act applies to the colonies located adjacent to the proposed RT-2 dredged material disposal site. Applicable mitigation will be recommended in this report.

5.10 Other Coordination Requirements - In addition to the aforementioned Federal statutes, the proposed project must also comply with other applicable or relevant and appropriate Federal laws. Table 5.1 below presents a comprehensive list of

environmental protection statutes, executive orders, etc. The Scoping Fact Sheet was used as the first step to disseminate pertinent project information to meet the applicable coordination/ consultation requirements required under their provisions. Further coordination and consultation to achieve compliance with the following laws, orders and policies will be conducted during the planning, preparation and coordination of the DMMP/EIS. The draft DMMP/EIS will receive wide distribution during the public comment period.

Table 5.1 Federal Environmental Protection Laws, Orders, Policies.

Laws and Policies	Compliance
American Folklife Preservation Act, P.L. 94-201; 20 U.S.C. 2101, <i>et seq.</i>	NA
Anadromous Fish Conservation Act, P.L. 89-304; 16 U.S.C. 757, <i>et seq.</i>	TBD
Antiquities Act of 1906, P.L. 59-209; 16 U.S.C. 431, <i>et seq.</i>	FC
Archaeological and Historic Preservation Act, P.L. 93-291; 16 U.S.C. 469, <i>et seq.</i> (Also known as the Reservoir Salvage Act of 1960, as amended; P.L. 93-291, as amended; the Moss-Bennett Act; and the Preservation of Historic and Archaeological Data Act of 1974.)	FC
Bald Eagle Act; 16 U.S.C. 668.	FC
Clean Air Act, as amended; P.L. 91-604; 42 U.S.C. 1857h-7, <i>et seq.</i>	FC
Clean Water Act, P.L. 92-500; 33 U.S.C. 1251, <i>et seq.</i> (Also known as the Federal Water Pollution Control Act; and P.L. 92-500, as amended.)	FC
Coastal Barrier Resources Act of 1982, 16 U.S.C. § 3501 <i>et seq.</i> ; 12 U.S.C. § 1441 <i>et seq.</i>	NA
Coastal Zone Management Act of 1972, as amended, P.L. 92-583; 16 U.S.C. 1451, <i>et seq.</i>	FC
Endangered Species Act of 1973, as amended, P.L. 93-205; 16 U.S.C. 1531, <i>et seq.</i>	FC
Estuary Protection Act, P.L. 90-454; 16 U.S.C. 1221, <i>et seq.</i>	NA
Federal Environmental Pesticide Control Act, P.L. 92-516; 7 U.S.C. 136.	NA
Federal Water Project Recreation Act, as amended, P.L. 89-72; 16 U.S.C. 460-1(12), <i>et seq.</i>	FC
Fish and Wildlife Coordination Act of 1958, as amended, P.L. 85-624; 16 U.S.C. 661, <i>et seq.</i>	FC
Historic Sites Act of 1935, as amended, P.L. 74-292; 16 U.S.C. 461, <i>et seq.</i>	FC
Land and Water Conservation Fund Act, P.L. 88-578; 16 U.S.C. 460/-460/-11, <i>et seq.</i>	NA
Migratory Bird Conservation Act of 1928; 16 U.S.C. 715.	FC
Migratory Bird Treaty Act of 1918; 16 U.S.C. 703, <i>et seq.</i>	FC
National Environmental Policy Act of 1969, as amended, P.L. 91-190; 42 U.S.C. 4321, <i>et seq.</i>	FC
National Historic Preservation Act of 1966, as amended, P.L. 89-655; 16 U.S.C. 470a, <i>et seq.</i>	FC
Native American Religious Freedom Act, P.L. 95-341; 42 U.S.C. 1996, <i>et seq.</i>	FC

Resource Conservation and Recovery Act of 1976, P.L. 94-580; 7 U.S.C. 1010, <i>et seq.</i>	NA
River and Harbor Act of 1899, 33 U.S.C. 403, <i>et seq.</i> (Also known as the Refuse Act of 1899.)	FC
Submerged Lands Act of 1953, P.L. 82-3167; 43 U.S.C. 1301, <i>et seq.</i>	FC
Surface Mining and Reclamation Act of 1977, P.L. 95-89; 30 U.S.C. 1201, <i>et seq.</i>	TBD
Toxic Substances Control Act, P.L. 94-469; 15 U.S.C. 2601, <i>et seq.</i>	NA
Laws and Policies	Compliance
Watershed Protection and Flood Prevention Act, as amended, P.L. 83-566; 16 U.S.C. 1001, <i>et seq.</i>	NA
Wild and Scenic Rivers Act, as amended, P.L. 90-542; 16 U.S.C. 1271, <i>et seq.</i>	NA
Executive Order 11593, Protection and Enhancement of the Cultural Environment. May 13, 1979 (36 FR 8921; May 15, 1971).	FC
Executive Order 11988, Floodplain Management. May 24, 1977 (42 FR 26951; May 25, 1977).	FC
Executive Order 11990, Protection of Wetlands. May 24, 1977 (42 FR 26961; May 25, 1977).	FC
Executive Order 11514, Protection and Enhancement of Environmental Quality, March 5, 1970, as amended by Executive Order, 11991, May 24, 1977.	FC
Executive Order 12088, Federal Compliance with Pollution Control Standards, October 13, 1978.	FC
Executive Order 12372, Intergovernmental Review of Federal Programs, July 14, 1982.	FC
Executive Order 12856, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements, August 3, 1993.	NA
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994.	FC
Council on Environmental Quality Memorandum of August 11	FC
Council on Environmental Quality Memorandum of August 10	FC
Migratory Bird Treaties and other international agreements listed in the Endangered Species Act of 1973	FC

NA: *Not Applicable*

NC: Non Compliance

FC: Full Compliance

TBD: To Be Determined

6.0 COORDINATION, CONSULTATION, AND PUBLIC INVOLVEMENT

6.1 INTRODUCTION

Since recognition of the need to prepare a Dredged Material Management Plan for Lorain Harbor in early 2003 (refer to Appendix C – Preliminary Assessment) numerous public and agency information sessions and meetings have been held with local interests and local, state and Federal agencies. In particular, close coordination and cooperation has been maintained with representatives of the City of Lorain and the Lorain Port Authority regarding the formulation and locations of alternative measures for dredged material disposal at Lorain. The following paragraphs will discuss the outcomes of several information sessions and meetings held in Lorain since the decision was made to prepare an environmental impact statement for this study. This section will also discuss other coordination and consultation efforts and requirements.

6.2 NEPA DOCUMENTATION

6.2.1 Scoping – A public meeting was held in Lorain, Ohio on May 22, 2003 for the purposes of both NEPA scoping and Plan Formulation. It was well attended and covered by the local newspaper.

On April 11, 2005, a Public Scoping Information Packet was sent out to numerous Federal, State, Tribal, and local agencies discussing the proposed alternatives for the Dredged Material Management Plan (DMMP) at Lorain Harbor, Ohio. The Scoping Packet asked for input and recommendations from the agencies on the proposed alternatives. A summary of comments received is shown below.

STAKEHOLDER COMMENTS ON SCOPING FACT SHEET (11 Apr 05)			
Date	Stakeholder	Comment	Response
18 Apr 05	Eastern Shawnee Tribe of Oklahoma	<ul style="list-style-type: none">No Indian Religious SitesRequest notification and further consultation if NAGPRA items are encountered during construction.	Acknowledged.
20 Apr 05	Prairie Band Potawatomi Nation	<ul style="list-style-type: none">No known historical cultural resources within project areaContact in the event of any inadvertent discoveries	Acknowledged.
20 Apr 05	US Dept. of Housing and Urban Development-Ohio State Office	<ul style="list-style-type: none">No special interests or concerns	Acknowledged.

STAKEHOLDER COMMENTS ON SCOPING FACT SHEET (11 Apr 05)			
Date	Stakeholder	Comment	Response
22 Apr 05	The Huron Historical Society Inc.	<ul style="list-style-type: none"> Opposed to deposition of Lorain Harbor dredged material in Huron Harbor CDF. 	Concur. This measure was not carried to detailed planning. Transportation costs would be prohibitive. The cost of transporting dredged material in 1,000 to 1,500 cy scows, pushed by tugs 25 miles each way from Lorain to Huron would be extremely high. Also, sediments currently dredged at Huron Harbor are not contaminated and are placed in a designated open lake site in Lake Erie. This is a recent change from historical practices when Huron Harbor sediments were considered contaminated and placed in the CDF. The existing space in Huron Harbor CDF provides a safety valve for commercial navigation at Huron Harbor if for some reason Huron Harbor sediments fail Federal guidelines for open lake placement and require containment in a CDF.
29 Apr 05	First Energy	<ul style="list-style-type: none"> No facilities identified at RT-2 	Acknowledged.
9 May 05	Seneca Nation Tribal Historic Preservation	<ul style="list-style-type: none"> Request to be a consulting party 	Acknowledged.
9 May 05	US Environmental Protection Agency-Region 5	<ul style="list-style-type: none"> Awaiting next level of documentation before deciding to comment 	Acknowledged.
18 May 05	Terminal Ready Mix, Inc.	<ul style="list-style-type: none"> Encourages continued dredging of Lorain Harbor 	Acknowledged.
18 May 05	US Fish and Wildlife Service-Reynoldsburg Field Office	<ul style="list-style-type: none"> Strongly encourages beneficial reuse of dredged material 	Beneficial use alternatives will be considered in depth in the DMMP/EIS.
		<ul style="list-style-type: none"> Strongly supports watershed management to reduce sediment loads. 	
		<ul style="list-style-type: none"> Supports continued use of Lorain Harbor CDF. No objection to vertical expansion, but horizontal expansion would impact nearshore lake bottom habitat. 	

STAKEHOLDER COMMENTS ON SCOPING FACT SHEET (11 Apr 05)			
Date	Stakeholder	Comment	Response
		<ul style="list-style-type: none"> Use of Huron Harbor CDF does not provide solution to long-term management of dredged material from Lorain Harbor. May result in similar issues at Huron Harbor. 	Concur.
		<ul style="list-style-type: none"> Assess impacts of potential contaminants in the dredged material 	In 2004 sediment and water samples were analyzed within the CDF and in the waters immediately adjacent to the facility, in support of a contaminant monitoring assessment of the CDF.
		<ul style="list-style-type: none"> Project area is within the range of the bald eagle (T). Nest located 1.5 miles from RTI-3. Consider impacts on nesting and foraging. 	Biological Assessment of effects to be completed and submitted to USFWS.
		<ul style="list-style-type: none"> Project area is within the range of the Indiana bat (E), piping plover (E), and eastern massasauga (C). No effect on these species. 	Concur.
24 May 05	Ohio Dept. of Natural Resources	<ul style="list-style-type: none"> Div. of Natural Areas and Preserves identifies one record of rare and endangered species (Great Blue Heron colony at RTI-2) and two managed areas [Lorain County Metro Park District parcel (island) and French Creek Reservation] 	Concur. A significant great blue heron rookery is located along the left streambank adjacent to RT-2. In Ohio, great blue heron breeding occurs generally from the end of March through mid-April. The hatching period begins twenty eight days after of incubation, usually reaching its peak in May. Once the young herons hatch, they are helpless. After about sixty days, the young birds will have matured enough to leave the nest (ODNR-Division of Wildlife). A “no construction” timeframe from March 15 to May 31 will be in effect during dredging & disposal operations. A 100 yd. buffer will also be utilized between the rookery and the dredging operations.
		<ul style="list-style-type: none"> Div. of Wildlife: no comments 	Acknowledged.
		<ul style="list-style-type: none"> Office of Coastal Management: 	
		<ul style="list-style-type: none"> o no Shore Structure Permit or Submerged Land Lease required 	Acknowledged.

STAKEHOLDER COMMENTS ON SCOPING FACT SHEET (11 Apr 05)			
Date	Stakeholder	Comment	Response
		<ul style="list-style-type: none"> ○ Federal Consistency Determination required 	Rectify with ODNR (for upstream locations)
27 May 05	Ohio Historical Society (SHPO)	<ul style="list-style-type: none"> • SHPO records indicate a number of archaeological sites, inventoried buildings, and NRHP-listed properties along the Black River 	<p>Concur. Since maintenance dredging would be limited to existing navigation channels, no historic properties are expected to be affected. The open lake placement site was last used in the 1970's and there are no records of any shipwrecks at this site. Dredged material placed at the site would effectively "cap" any previously unrecorded sites in-situ and would have no adverse effect. Since the construction of interior berms within the existing CDF would use in-place dredged material at a site that was heavily disturbed by its original construction in 1978, no adverse effects on historic properties would result. Also, the proposed berms would not adversely affect the views of the Lorain Lighthouse. Additional consultation under Section 106 of the National Historic Preservation Act (NHPA) would be required to determine the effects of CDF construction on historic properties. Construction of a new CDF would be subject to site-specific NHPA Section 106 review. Unknown historic properties could be affected by construction activities. To date, no historic properties have been identified along the Outer Breakwater and therefore adverse effect is expected.</p>
		<ul style="list-style-type: none"> • Consult with Lake Erie Shipwreck Research Center regarding underwater sites. 	Consulted via Scoping Fact Sheet. No comments received.
		<ul style="list-style-type: none"> • Upland locations considered for fill sites are former industrial sites. Further information regarding condition and potential for affecting historic properties will be needed. 	Concur.

The Corps received input that included concerns/issues regarding dredging and disposal management, environmental matters, and potential beneficial uses of dredged material. Some issues identified included:

- Opposition to disposal of dredged material at the Huron CDF,
- Support of continued Federal dredging at Lorain Harbor,
- Support of beneficial uses,
- Support of watershed management to reduce sediment load,
- Support of vertical expansion and continued use of the existing CDF,
- Information on wildlife species and cultural resources.

The scoping information is included in Appendix E.

The Notice of Intent to prepare a draft Environmental Impact Statement (DEIS) for the proposed DMMP was published in the *Federal Register* on March 6, 2007 (Appendix E).

6.3 Future Schedule - The current schedule for major actions related to the preparation and coordination of this DMMP is outlined below:

- April 2008 – Alternative Formulation Briefing complete.
- July 2008 – Release Draft DMMP/EIS for Public Comment.
- August 2008 – Public meeting in Lorain.
- October 2008 – Preliminary Final DMMP/EIS completed.
- January 2009 – Corps Division review and approval
- April 2009 - Record of Decision signed.

6.4 Meetings with Resource Agencies – The first meeting with local stakeholders was held on January 19, 2001 at the Lorain Port Authority Office in Lorain, Ohio to discuss the short and long term options for dredged material disposal and dredged material management from the existing Federal Navigation Channel at Lorain (MFR, January 31, 2001, P. Berkeley). Since then, regular meetings and frequent coordination has taken place between the Corps and stakeholders with site visits, phone calls/teleconferences, email, and status updates.

6.5 Lorain Task Force - The City formed the Lorain Task Force in the 1970's shortly after the Lorain CDF was constructed. The purpose of the Task Force is to address eventual use of the CDF once it is filled and turned over to the City. The Lorain Task Force is comprised of most of the constituents and regulatory agencies which would be involved in the preparation of a CDF Master Plan.

6.6 ISSUE RESOLUTION CONFERENCE DOCUMENTATION

6.6.1 Feasibility Scoping Meeting - The primary purpose of Feasibility Scoping Meeting (FSM) was to provide relevant DMMP study information to the USACE vertical team (Great Lakes and Ohio River Division and Headquarters, non-Federal partners, agency representatives and others) consistent with the guidance provided in ER 1005-2-

100, Planning Guidance Notebook (USACE, 2005). This documentation and the meetings surrounding it addressed the items specified for Feasibility Scoping Meetings (FSMs) in Exhibit G-3 of ER 1005-2-100.

The basic objectives of the FSM are as follows:

- Engage the USACE vertical team (District, Division, and HQ USACE).
- Identify, discuss and resolve policy issues.
- Provide an update of study findings and progress.
- Resolve technical/policy issues that could delay the study.
- Encourage sponsor and resource agency participation.
- Reach an agreement on scope of study and problems/solutions to be investigated.

The FSM was conducted by teleconference on August 31, 2005. Participants included Buffalo and Detroit Districts, Great Lakes & Ohio River Division (LRD), Headquarters, the ITR Team Leader, and the Lorain Port Authority (sponsor). The formal guidance memorandum was issued by LRD on October 12, 2005 and can be found in Appendix A. The Memorandum for Record confirmed District assumptions, analyses, and proposals and documented issues to be resolved by the Buffalo District for incorporation in the draft DMMP/ EIS.

6.6.2 Alternative Formulation Briefing - The Alternative Formulation Briefing (AFB) was held on April 7, 2008 by teleconference and involved the Buffalo District, LRD, Office of Water Projects Review –Headquarters, the ITR Team, and the non-Federal sponsor. The AFB is held at a point where most of the project planning has been completed and to confirm that technical and policy concerns regarding the tentatively selected plan have been resolved during project planning. The purpose of the AFB is to confirm the plan formulation and selection process, the tentatively selected plan, and that the definition of Federal and non-Federal responsibilities are consistent with applicable laws, statutes, Executive Orders, regulations, and current policy guidance. The end product of IRC #2 will be a LRD issued Program Guidance Memorandum (PgM). The PgM will be used by the Buffalo District to complete all required detailed analysis and make final preparations of the draft DMMP/EIS for release for 45-day NEPA public review.

6.6.3 Documentation Format – Consistent with the requirements of ER 1005-2-100, the Buffalo District provided a preliminary draft DMMP/EIS for the Alternative Formulation Briefing. The ultimate draft and final DMMP/EIS will be a combined document rather than separate stand alone reports. This AFB documentation, which represents an early iteration of the Planning Process, was provided in the same format as ultimately envisioned for the draft and final DMMP/EIS.

6.6.4 Documentation Content – As discussed in Exhibit G-3 and G-5 of ER 1005-2-100, the AFB documentation included:

- Report text which included:

- Study background.
- Current Description of Future Without Project Condition Problems, Opportunities, Goals, Objectives, and Constraints
- Formulation and Evaluation of Alternative Plans
- Status of environmental compliance actions, coordination, and NEPA documentation.
- Status of non-Federal sponsor support.
- Environmental compliance consistent with a 75 percent draft product
- Engineering analysis consistent with a feasibility-level planning document
- Project Study Issue Check List
- ITR comments and certification
- Legal review consistent with a 75 percent draft product
- District policy compliance review consistent with a 75 percent draft product
- FSM Compliance Memorandum
- Transmittal Memorandum

6.6.5 Independent Technical Review – The In-Progress Review Packet underwent Independent Technical Review (ITR) by the Plan Formulation/Navigation Regional Technical Specialist in the Huntington District. The ITR Certification was signed on October 21, 2005. The DMMP/EIS underwent a full ITR again prior to the Alternative Formulation Briefing. That ITR Certification was signed on September 24, 2007.

6.7 NEPA Public Meeting – A public meeting will be held in Lorain in August 2008 during the public comment period on the draft DMMP/EIS.

6.8 ENDANGERED SPECIES ACT

6.8.1 Endangered Species Act Consultation – In accordance with Section 7 of this Act, USACE-Buffalo District has consulted with the U.S. Fish and Wildlife Service (USFWS) and Ohio Department of Natural Resources (ODNR)-Division of Natural Areas and Preserves for information on listed or proposed species or designated or proposed critical habitat that may be present in the project area. USFWS noted that the project area is located within the range of the Indiana bat (Endangered), piping plover (Endangered), and eastern massasauga (Candidate Species). However, it has been concluded that the proposed project would result in no effect on these species.

6.9 TRIBAL CONSULTATION

6.9.1 Consultation – The Corps recognizes that Tribal governments are sovereign entities. We are working to meet trust obligations, protect trust resources, and obtain Tribal views of trust and treaty responsibilities. Corps leaders and Tribal leaders will meet and recognize that, as governments, Tribes have the right to be treated in accordance with principles of self-determination. Tribes will be involved in a collaborative process designed to ensure meaningful communication, consideration of

disparate viewpoints before and during decision-making, and utilization of fair and impartial dispute resolution.

6.9.2 Laws and Statutes Relating to Tribal Interests - There are many Federal laws, executive orders, policy directives, and Federal regulations that address responsibilities of the executive branch agencies regarding tribal interests. Collectively, these form the basis of how consultation is conducted and have had a profound impact on Federal-tribal relations. Examples of the statutes specifically discussing tribal interests are the National Historic Preservation Act, Archeological Resources Protection Act, NAGPRA, Executive Order 13007, Indian Sacred Sites, and Executive Order 13175, Consultation and Coordination of Indian Tribal Governments.

In October 1998, the Secretary of Defense William S. Cohen issued the Department of Defense American Indian and Alaska Native Policy after an extensive effort to coordinate with the over 500 sovereign, federally-recognized tribal governments in the United States.

Specifically, places of cultural and religious significance to tribes are to be considered by Federal agencies in policy and project planning. The Corps is increasingly engaging and involving tribes in collaborative processes designed to facilitate the exchange of information and to effectively address effects of Federal actions and policies on tribal interests and rights.

6.9.3 U.S. Army Corps of Engineers Policy Guidance and American Indian Tribes - In February 1998, Lt. General Joe N. Ballard, Chief of Engineers, USACE, published a Memorandum for Commanders, Major Subordinate Commands and District Commands: Policy Guidance Letter No. 57, Indian Sovereignty and Government-to-Government Relations with Indian Tribes. In it, he established the U.S. Army Corps of Engineers Tribal Policy Principles detailed below:

**“U.S. ARMY CORPS OF ENGINEERS
TRIBAL POLICY PRINCIPLES**

TRIBAL SOVEREIGNTY - The U.S. Army Corps of Engineers recognizes that Tribal governments are sovereign entities, with rights to set their own priorities, develop and manage Tribal and trust resources, and be involved in Federal decisions or activities which have the potential to affect these rights. Tribes retain inherent powers of self-government.

TRUST RESPONSIBILITY - The U.S. Army Corps of Engineers will work to meet trust obligations, protect trust resources, and obtain Tribal views of trust and treaty responsibilities or actions related to the Corps, in accordance with provisions of treaties, laws and Executive Orders as well as principles lodged in the Constitution of the United States.

GOVERNMENT-TO-GOVERNMENT RELATIONS - The U.S. Army Corps of

Engineers will ensure that Tribal Chairs/Leaders meet with Corps Commanders/Leaders and recognize that, as governments, tribes have the right to be treated with appropriate respect and dignity, in accordance with principles of self-determination.

PRE-DECISIONAL AND HONEST CONSULTATION - The U.S. Army Corps of Engineers will reach out, through designated points of contact, to involve tribes in collaborative processes designed to ensure information exchange, consideration of disparate viewpoints before and during decision making, and utilize fair and impartial dispute resolution mechanisms.

SELF RELIANCE, CAPACITY BUILDING, AND GROWTH - The U.S. Army Corps of Engineers will search for ways to involve Tribes in programs, projects and other activities that build economic capacity and foster abilities to manage Tribal resources while preserving cultural identities.

NATURAL AND CULTURAL RESOURCES - The U.S. Army Corps of Engineers will act to fulfill obligations to preserve and protect trust resources, comply with the Native American Graves Protection and Repatriation Act, and ensure reasonable access to sacred sites in accordance with published and easily accessible guidance.”

6.9.4 Government-to-Government Consultation Status - The Corps initiated consultation with tribal interests through the scoping process on April 11, 2005. The Scoping Packet was sent to 26 tribes. Comments were received from the Eastern Shawnee Tribe of Oklahoma, Prairie Band of Potawatomi Nation, and Seneca Nation. The Seneca Nation requested consulting party status.

6.10 U.S. Fish and Wildlife Coordination Act – The Fish and Wildlife Coordination Act provides the basic authority for USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features. It also requires Federal agencies that construct, license or permit water resource development projects to first consult with the Service (and the National Marine Fisheries Service in some instances) and State fish and wildlife agency regarding the impacts on fish and wildlife resources and measures to mitigate these impacts (Fish and Wildlife Coordination Act).

The USFWS completed a Fish and Wildlife Coordination Act Report pertaining to the proposed Lorain DMMP on August 17, 2007 (Appendix J). It identified potential impacts, issues, and concerns related to fish and wildlife species and habitat in and around the designated project area. Comments in this report were taken into consideration by the Buffalo District and to the maximum extent practicable, addressed in the planning, design, and construction phases of the project. Recommendations from the USFWS are stated below.

USFWS Coordination Act Report Summary	
USFWS Comments and Recommendations	USACE Response to Comments
Fully implement BMPs in the watershed to minimize the volume of eroded materials entering Lorain Harbor.	Concur, under 516(e) Great Lakes Tributary Sediment Transport Modeling Program, USACE developed a Black River Watershed model that was transferred to local interests in 2007. The purpose of the model is to identify and implement measure to reduce sediment loads.
Explore additional beneficial use sites for dredged material in the Black River watershed.	Concur, currently a total of four brownfields have been assessed for potential beneficial use measures. USACE continues to seek opportunities and locations to implement BMPs.
Maximize existing CDF through Fill Management Plans to delay the need for construction of a new facility.	Concur, USACE will implement a FMP at the existing CDF to maximize capacity (Section 1.8.5.1 and Section 2.11.1.5).
Fully implement BMPs during maintenance dredging operations to minimize impacts to water quality in the harbor.	USACE requests the dredging contractor monitor river flows and wind conditions and take appropriate actions to ensure that turbidity plumes associated with dredging operation will not affect water quality in the harbor and at the public water intake.
Fully implement BMPs during any possibly construction activities to increase capacity at an existing CDF or to build a new CDF	Concur, current beneficial use measures under consideration to increase capacity at the existing CDF include FMPs.
Consult ODNR regarding seasonal restrictions of dredging activities to protect fishery resource during the spawning period in particular.	Concur, USACE consulted ODNR and the current environmental window when in water work is permitted for Lorain Harbor and Black River is June 15 to March 1.
Limit activity within 660 feet of Great Blue Heron Rookery during the nesting season.	Concur.
Establish a large, diverse riparian corridor along Black River at beneficial site.	The City of Lorain is the permanent landowner of RT-2; they will be required to obtain applicable State and Federal permits, and modify the property as necessary to comply with applicable regulations.
Construct a wetland adjacent to the Black River to reduce runoff and provide foraging area for the great blue herons and other aquatic birds.	
Seed all disturbed areas with native vegetation.	The City of Lorain is the permanent landowner of RT-2, and therefore the party responsible for management of the site.

7.0 LIST OF PREPARERS

The following Buffalo District, U.S. Army Corps of Engineers personnel were involved in the preparation of this DMMP/EIS:

Philip E. Berkeley is a Biologist in the Planning Branch at the U.S. Army Corps of Engineers, Buffalo District. He received a B.S. in Biology from Springfield College in Springfield, Massachusetts and M.S. in Biology from the State University of New York at Buffalo. He has over 30 years federal government experience in Corps of Engineers Planning and Project Evaluation.

Paul Bijhouwer is the Navigation Structure Repair Manager in the Operations Branch at the U.S. Army Corps of Engineers, Buffalo District. He received a B.S. in Civil Engineering from the University of New Orleans. He has 5 years Federal government experience, 12 years of private sector experience, and is a Professional Engineer registered by New York State.

William Butler is an Environmental Protection Specialist in the Environmental Analysis Section at the U.S. Army Corps of Engineers, Buffalo District. He received a B.A. in Geography from the State University of New York at Buffalo. He has 29 years Federal experience in environmental analysis, impact studies and environmental compliance with the U.S. Army Corps of Engineers, Buffalo District.

Lynn M. Greer is an Outreach Program Specialist in the Planning Branch at the U.S. Army Corps of Engineers, Buffalo District. She received a B.S. in Geology, B.A. in Italian, and M.S. in Environmental Science from the State University of New York, College at Buffalo. She has nine years Federal government experience. Prior to serving as the Outreach Coordinator, Lynn served five years as a Physical Scientist and Technical Manager of the DMMP EIS. Lynn assisted with writing, and provided review and comment of the Draft DMMP EIS.

Roger E. Haberly is a Regional Economist in the Planning Branch at the U.S. Army Corps of Engineers, Buffalo District. He received a B.A. in Economics from Canisius College, Buffalo, New York, and his M.A. in Economics from the State University of New York at Buffalo. He has over 25 years federal government experience in Planning and Project Evaluation with the U.S. Army Corps of Engineers, Buffalo District.

Michele L. Hope was an Archeologist and Project Manager in the Planning Branch of the Buffalo District of the U.S. Army Corps of Engineers. She received a B.A. in Anthropology and a M.A. in Archeology and Museum Studies from George Washington University, and a M.P.A. in Public Administration from the University of Alaska, Anchorage. She has 30 years federal government experience in cultural resources management, environmental coordination, planning and policy, public affairs, and project management.

Patti McKenna is a Physical Scientist in the Planning Branch of the U.S. Army Corps of Engineers, Buffalo District. She received a B.S. in Environmental/Urban Planning from the State University of New York at Buffalo and is currently pursuing her Master's Degree in Interdisciplinary Studies. She has 25 years Federal government experience.

Karen Keil is a Risk Assessor in the Environmental Health Section of the U.S. Army Corps of Engineers, Buffalo District. She received a B.A. in Biochemistry from the University of Wisconsin-Madison, and a Ph.D. in Environmental Toxicology from Cornell University. She has 7 years of federal government experience working with projects involving hazardous, toxic, and radioactive wastes, as well as the management of dredged material.

Michael Mohr is the Regional Technical Specialist for Coastal Engineering in the Great Lakes. He received a B.S. in Civil Engineering from the State University of New York at Buffalo and an M.S. in Fluid Mechanics and Hydraulics from the University of Connecticut. He has 30 years federal experience in Hydrology and Coastal Engineering.

Joseph Rowley is a Physical Scientist in the Regulatory Section of the U.S. Army Corps of Engineers, Buffalo District. He received a B.A. in Geology and a B.A. in Environmental Studies at the State University of New York at Buffalo and is currently pursuing his Master's Degree in Environmental Analysis/GIS. He has 5 years federal government experience.

Reed Vetovitz is a Geotechnical Engineer in the Design Branch of the U.S. Army Corps of Engineers, Buffalo District. He received a B.A. in pre-engineering from Baldwin-Wallace College, a B.S. in Civil Engineering from Case Western Reserve University, and a M.S. in Civil Engineering from the University of Cincinnati. He has 10 years of experience as a Civil Engineer.

James Wryk is an Estimator in the Design Branch, Cost and Project Engineering Team. He has 28 years federal service with 23 years in the estimating field.

8.0 COORDINATION/CONSULTATION

Coordination and consultation relative to the proposed Federal action has involved the following nations, agencies, individuals, and organizations (see Table 8.1).

Table 8.1. List of Nations, Agencies, Organizations, and Individuals	
Tribal Nations	
Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation	Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Bay Mills Indian Community, Michigan	Minnesota Chippewa Tribe, Minnesota
Chippewa-Cree Tribe of the Rocky Boy's Reservation, Montana	Ottawa Tribe of Oklahoma
Citizen Potawatomi Nation, Oklahoma	Pokagon Band of Potawatomi Indians, Michigan and Indiana
Delaware Nation, Oklahoma	Prairie Band of Potawatomi Nation, Kansas
Delaware Tribe of Indians, Oklahoma	Red Cliff Band of Chippewa Indians, Minnesota
Forest County Potawatomi Community, Wisconsin	Saginaw Chippewa Tribe of Michigan
Hannahville Indian Community, Michigan	St. Croix Chippewa Indians of Wisconsin
Huron Potawatomi, Inc., Michigan	Seneca Nation of Indians
Keweenaw Bay Indian Community, Michigan	Seneca-Cayuga Tribe of Oklahoma
Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin	Sokaogon Chippewa Community, Wisconsin
Little River Band of Ottawa Indians, Michigan	Tonawanda Seneca Nation
Little Traverse Bay Bands of Odawa Indians, Michigan	Wyandotte Tribe of Oklahoma
Federal	
Sherrod Brown, U.S. Senator	U.S. Department of Commerce: National Oceanic and Atmospheric Administration
George Voinovich, U.S. Senator	U.S. Department of Energy
Betty Sutton, Representative in Congress	U.S. Department of Health and Human Services
Advisory Council on Historic Preservation	U.S. Department of Housing and Urban Development
Federal Emergency Management Administration	U.S. Department of the Interior: Fish and Wildlife Service National Park Service
Federal Maritime Commission	U.S. Department of Transportation: Coast Guard Federal Highway Administration
U.S. Department of Agriculture: Farm Service Agency Forest Service Natural Resource Conservation Service	U.S. Environmental Protection Agency
State	
Ohio Department of Health	Ohio Environmental Protection Agency

Table 8.1. List of Nations, Agencies, Organizations, and Individuals	
Ohio Department of Natural Resources	Ohio State Historic Preservation Office
Ohio Department of Transportation	
Local/Regional	
Northeast Ohio Areawide Coordinating Agency	Lorain County Metroparks
Lorain County Community College	City of Lorain: Mayor City Engineer Community Development Department Utilities Department
Lorain County Health Department	Village of Sheffield: Mayor Clerk Planning Department
Individuals/Organizations	
Advanced Automotive Systems	Lorain County Chamber of Commerce
American Metal Chemical Corp.	Lorain County Community Alliance
Beaver Park Marina	Lorain County Urban League
Beaver Park North, Inc.	Lorain Port Authority
Black River Conservation Association	Lorain Sailing & Yacht Club
Black River Historical Society	Lower Great Lakes Marine Historical Society
Columbia Gas of Ohio	Mainstreet Lorain Development Corp.
Community Foundation of Greater Lorain	National Gypsum Co.
Copper Kettle Marina	Ohio Bass Chapter Federation
Drawbridge Cove	Ohio Fish Producers Association
Ducks Unlimited	Port of Lorain Foundation, Inc.
Falbo Construction Co.	Republic Engineered Products, Inc.
First Energy Corp.	Republic Technologies International, Inc.
Gene's Marine Sales & Service	Sandusky Register
Great Lakes Commission	Sierra Club
Great Lakes Fishery Commission	Spitzer Hotel & Marina
Great Lakes Tomorrow	Spitzer Lakeside Marina
Great Lakes United	Spitzer Management Group
Huron Historical Society	Spitzer Riverside Marina
IBEW Local 129	Stein Inc.
Jackalope Bar & Rotisserie	Terminal Ready Mix, Inc.
Jonnick Dock & Terminal	The Morning Journal
Lake Carriers Association	The Nature Conservancy
League of Ohio Sportsmen	Trout Unlimited

9.0 GLOSSARY, ACRONYMS/ABBREVIATIONS

9.1 Glossary - This glossary defines terms that are found in the Public Scoping Information Packet and will be included in the draft and final DMMP/EIS:

Air Quality Control Region (AQCR): Federally designated area that is required to meet and maintain federal ambient air quality standards. May include nearby locations in the same state or nearby states that share common air pollution problems

American Society for Testing and Materials (ASTM): An international standards developing organization that develops and publishes voluntary technical standards for a wide range of materials, products, systems, and services.

Archaeological Resource: See cultural resource.

Authorized Project: A project established by the authority of the U.S. Congress for the specific purposes described in the legislation (e.g., flood control, power generation, navigation, irrigation, recreation, fish and wildlife, etc.).

Black River Remedial Action Plan (RAP): The Black River is the only river system in Ohio where the entire watershed has been designated as an Area of Concern. The RAP now aims to combat nonpoint source impacts through precision farming techniques, the utilization of best management practices during construction, and the restoration, enhancement, and protection of the Black River riparian corridor.

Brownfield: Abandoned, idled, or underused industrial or commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.

Buffer: Usually a natural area or open space used to divide two developed or developing areas.

Centimeter (cm): A unit of measurement that is 1/100th of a meter or approximately 4/10ths of an inch (0.39 inch).

Comprehensive Environmental Response, Compensation, and Liability Information system (CERCLIS): This Federal database contains information on preliminary assessments, potential and actual hazardous waste sites, site inspections, and cleanup activities. CERCLIS sites are candidates for addition to the Federal and State Superfund lists.

CERCLIS-NFRAP: No further response action planned (NFRAP) sites are removed from CERCLIS. NFRAP occurs when, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the

site to be placed on the National Priority List (NPL), or the contamination was not serious enough to require federal Superfund action or NPL consideration.

Chief Financial Officer (CFO): The corporate executive having financial authority to make appropriations and authorize expenditures for a firm

Clamshell Dredging: Clamshell dredges use a bucket operated from a crane or derrick that is mounted on a barge or operated from shore. Dredged material comes up virtually undisturbed and is usually placed on a barge for disposal to either an upland or in-water site.

Clean Air Act (CAA): A set of laws passed in 1970 to regulate air pollution in the United States. The goal of this act was to improve air quality, and it was revised in 1990 to be more detailed about issues such as the hole in the ozone layer and acid rain.

Clean Water Act (CWA): A set of laws passed in 1972 to regulate water pollution in the US. This was the first-ever federal regulation of water pollution, and it gave the EPA the right to set standards and enforce them. The goal of this act is to completely stop the discharge of pollutants into the Waters of the United States and make all bodies of water in the US fishable and swimmable.

Coastal Zone Management: A Federally funded and approved state program under the Federal Coastal Zone Management Act of 1972. The program reviews Federal permitting, licensing, funding, and development activities in the coastal zone for consistency with state policies.

Confined Disposal Facility (CDF): An engineered structure for containment of dredged material.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): The Federal law that guides cleanup of hazardous waste sites.

Contaminants of Concern (COC): Contaminants in a given media (usually soil or water) above a risk level that may result in harm to the public or the environment.

Council on Environmental Quality (CEQ): An advisory council to the President, established by NEPA in 1966. It reviews Federal programs for their effect on the environment, conducts environmental studies and advises the President on environmental matters.

Council of Great Lakes Governors (CGLG): A non-partisan partnership of the Governors of the eight Great Lakes States - Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin. The Council encourages and facilitates environmentally responsible economic growth

Cubic Feet Per Second (cfs): A unit of measurement (English) that can be used to describe the flow rate or discharge of water. One cfs is equal to 449 gallons per minute.

Cultural Resource: Evidence of human occupation or activity that is important in the history, architecture, or archaeology of a community or region.

Dredged Material Management Plan (DMMP): The dredging and disposal plan that results from analyses conducted in the Dredged Material Management Study.

Dredged Material Management Study (DMMS): A programmatic study by the Corps of Engineers to provide harbor facilities for sediments dredged over a 20 year period. These studies follow guidance provided in ER-1105-2-100.

Department Of Environmental Quality (DEQ): A state department created to ensure clean air, water, and land in the state and protect citizens from the adverse health impacts of pollution.

Division of Emergency Response and Remedial Response Database (DERR): Database that contains sites with known or suspected contamination.

Easement: An interest or a privilege in land created by a provision in a deed or by an agreement that confers a right on the owner to some profit, benefit, dominion, or lawful use out of or over the estate of another.

Ecosystem: Living and nonliving components of the environment that interact or function together.

Endangered Species: Any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range. Endangered Species are published in the Federal Register.

Environmental Impact Statement (EIS): A report that documents the information required to evaluate the environmental impact of a project. It informs decision makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the environment.

Emergency Response Notification System (ERNS): U.S. Coast Guard National Response Center database of reported released of oil and hazardous substances.

Executive Order 12898: Issued February 11, 1994, eEstablishes environmental justice as a Federal government priority and directs all Federal agencies to make environmental justice part of their mission. Environmental justice calls for fair distribution of environmental hazards.

Fill: The placement, deposition, or stockpiling of sand, sediment, or other earth materials.

Facility Index System (FINDS): USEPA Facility Identification Initiative Program Summary Report. FINDS contains both facility information and “pointers” to other sources that contain more detail.

Former Manufactured Gas (Coal Gas) Sites: Proprietary historical database of former coal gas sites.

Greenspace: A term applied to certain urban areas, including parks, preserves and public or private lands. In general these places are over an acre large, are well separated from manmade developments and contain forests, gardens, grass or other foliage.

Habitat: The place or conditions where a plant or animal lives or can live. The plant or animal can be an individual organism, a population, or a taxonomic group. In the present context, habitat refers to an area that provides some portion of the requirements for the life history of a given species.

Low Water Datum: An approximation of Mean Low Water, used for harbor dredging purposes. LWD for Lake Erie is 569.2 feet above mean sea level at Rimouski, PQ, Canada, (International Great Lakes Datum, 1985)

Leaking Underground Storage Tank (LUST): LUST records contain an inventory of reported leaking underground storage tanks.

Micron: A metric unit of length equal to 1 millionth of a meter.

Mitigation: An additional action that compensates for loss of resources by providing substitute resources. The use of any or all of the following actions:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

Monitoring: A process of collecting information to evaluate if objectives and anticipated results of a management plan are being realized or if implementation proceeds as planned.

National Ambient Air Quality Standards (NAAQS): Standards set by the Environmental

Protection Agency that identify the limit of concentrations of certain air pollutants that endanger public health or welfare.

Native American Graves Protection and Repatriation Act (NAGPRA): The 1990 Act address the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to Native American human remains, funerary objects, sacred objects, and objects of cultural significance. The statute requires Federal agencies and museums to provide information about Native American cultural items to parties with standing and, upon presentation of a valid claim, ensure the item(s) undergo disposition or repatriation.

National Environmental Policy Act (NEPA): The Federal law, going into effect on January 1, 1970, that established a national policy for the environment and requires Federal agencies (1) to become aware of the environmental ramifications of their proposed actions, (2) to fully disclose to the public proposed federal actions and provide a mechanism for public input to federal decision making , and (3) to prepare environmental impact statements for every major action that would significantly affect the quality of the human environment.

National Historic Preservation Act: A Federal statute passed in 1966 that established a Federal program to further the efforts of private agencies and individuals in preserving the Nation's historic and cultural foundations. NHPA authorized the establishing of the National Register of Historic Places, established the Advisory Council on Historic Preservation and a National Trust Fund to administer grants for historic preservation, and authorized the development of regulations to require Federal agencies to consider the effects of Federally assisted activities on properties included on or eligible for the National Register of Historic Places.

PCB Activity Database (PADS): USEPA database that identifies generators, transporters, commercial storers, and/or brokers and disposers of PCBs.

PM₁₀: An index of the Particulate Matter that can enter the thorax and cause or exacerbate lower respiratory tract diseases.

Project: The broad term covering Federally constructed and maintained channels and structures. A “Project” is a channel or facility constructed for variety of authorized purposes, such as, hydroelectric generation, flood control, navigation, etc.

Reach: A section of river, usually defined by River Mile.

Resource Conservation and Recovery Information System (RCRIS): Database of licensed hazardous waste treatment, storage, and disposal facilities.

Riparian: The area immediately adjacent to streams, ponds, lakes, and wetlands that directly contributes to the water quality and habitat components of the water body. This may include areas that have high water tables and soils and vegetation that exhibit

characteristics of wetness, as well as upland areas immediately adjacent to the water body that directly contribute shade, nutrients, cover, or debris, or that directly enhance water quality within the water body.

Spawning: Release and fertilization of eggs by fish.

Species: A group of organisms that can interbreed in nature (a common gene pool that is biologically isolated from closely related species) and is designated by an available and valid scientific name.

Threatened Species: Plant or animal species, identified and defined in accordance with the 1973 Endangered Species Act and published in the Federal Register, likely to become endangered through all or a significant portion of their range within the foreseeable future.

Total Organic Carbon (TOC): The amount of carbon bound in an organic compound and is often used as a non-specific indicator of water quality.

Toxic Equivalency Factors: Toxicity potency factors that are used by the World Health Organization (WHO), scientists, and regulators as a consistent method to evaluate the toxicities of highly variable mixtures of dioxin compounds.

Toxic Release Inventory System (TRIS): USEPA database that identifies facilities which release toxic chemicals to the environment in reportable quantities under SARA Title III Section 313.

Upland: Any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, and/or hydrologic characteristics associated with wetlands.

Water Quality: The chemical, physical, and biological characteristics of water.

Wetlands: Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, under normal circumstances, a prevalence of vegetation typically adapted for life in saturated soil conditions. This does not include riparian areas, rivers, streams, and lakes.

9.2 Acronyms/Abbreviations - The following acronyms have or will be used within documents pertaining to the Lorain Harbor Dredged Material Management Plan:

AFB – Alternative Formulation Briefing

AOC – Area of Concern

APE - Area of Potential Effect

AQCR - Air Quality Control Region

ASTM - American Society for Testing and Materials

BA - Biological Assessment

BMP - Best Management Practice

BOMP – Best Operational Management Practice

CAA - Clean Air Act

CADD - Computer Aided Drafting and Design

CDF – Confined Disposal Facility

CERCLA - Comprehensive Environmental Response Compensation Liability Act

CELRD - Corps of Engineers, Great Lakes and Ohio River Division

CEQ – Council on Environmental Quality

CFO - Chief Financial Officer

cfs - cubic feet per second

CGLG- Council of Great Lakes Governors

cm - centimeter

CO - Carbon monoxide

COC - Contaminants of Concern

Corps - U.S. Army Corps of Engineers, Buffalo District

CORRACTS – USEPA list of hazardous waste handlers with RCRA corrective action activity.

CSX - A Class 1 Railroad Company formed July 1, 1986 through the merger of Seaboard System Railroad and Chessie System; it services most of the east coast.

CWA - Clean Water Act

cy – Cubic yard

CZM - Coastal Zone Management

dBA - A-weighted decibels

DEIS - Draft Environmental Impact Statement

DERR – Division of Emergency Response and Remedial Response

DEQ - Department of Environmental Quality

DMMP - Dredged Material Management Plan

DMMP/EIS - Dredged Material Management Plan/ Environmental Impact Statement

DMMS - Dredged Material Management Study

DO - dissolved oxygen

EEI - Engineering and Environment Incorporated

EIS - Environmental Impact Statement

EPA - Environmental Protection Agency

ER - Engineering Regulation

ERDC - U.S. Army Engineer Research and Development Center

ERNS – Emergency Response Notification System

ESA - Endangered Species Act

FEMA – Federal Emergency Management Agency

FINDS – Facility Index System

FMP – Fill Management Plan

FSM – Feasibility Scoping Meeting

FY - fiscal year

GPS – Global Positioning System

HQUSACE – Headquarters, U.S. Army Corps of Engineers

HTRW - Hazardous, Toxic, or Radioactive Waste

IGLD – International Great Lakes Datum

IRC – Issue Resolution Conference

ISG - International Steel Group

ITR – Independent Technical Review

km - kilometer

LERRD – Lands, Easements, Rights-of-Way, Relocations and Disposal

LUST – Leaking Underground Storage Tank

LWD – Low Water Datum

m - meter

mg/L - milligrams per liter

mm - millimeter

NEPA - National Environmental Policy Act

NHPA - National Historic Preservation Act

NOI – Notice of Intent

NO₂ - Nitrogen Dioxide

NPL – National Priority List

NR - National Register

NRHP - National Register of Historic Places

NS – Norfolk Southern Corporation

ODNR – Ohio Department of Natural Resources

ODOT – Ohio Department of Transportation

OEPA – Ohio Environmental Protection Agency

O₃- Ozone

⁰F- Degrees Fahrenheit

O&M – Operations and Maintenance

PA- Preliminary Assessment

PADS – PCB Activity Database

PAH - Polynuclear Aromatic Hydrocarbons

Pb- Lead

PCB - Polychlorinated Biphenyls

PCA – Project Cooperation Agreement

PCS – Project Condition Survey

PED – Preconstruction, Engineering and Design

PM - particulate matter

PM₁₀- Particulate matter of 10 microns in diameter or smaller

ppb – parts per billion

ppm - parts per million

PSIP - Public Scoping Information Packet

RAP - Remedial Action Plan

RCRA - Resource Conservation and Recovery Act

RCRIS – Recourse Conservation and Recovery Information System

ROD - Record of Decision

SHPO - State Historic Preservation Office

SMSA – Standard Metropolitan Statistical Area

SO₂ – sulfur dioxide

SOW - Scope of Work

SPILLS – OEPA Emergency Response Database of former coal gas sites.

SSP - Steel Sheetpile

SWF/LF – Solid waste facility/landfill facility

TEF - Toxic Equivalency Factors

TOC - Total organic carbon

TP - total phosphorus

TRIS – Toxic Release Inventory System

TSP – total suspended particles

TSS - total suspended solids

ug/m³ - Micrograms per cubic meter of air

USACE - U.S. Army Corps of Engineers

USACE, IWR - U.S. Army Corps of Engineers, Institute for Water Resources

USDOE - U.S. Department of Energy

USEPA - United States Environmental Protection Agency

USWA - United Steel Works Association

USFWS - U.S. Fish and Wildlife Service

USGS - U.S. Geological Survey

UST – Underground Storage Tank

USWRC - United States Water Resources Council

UTM - Universal Transverse Mercator

VAP – Voluntary Action Program

WRDA – Water Resources Development Act

WWTP – Wastewater Treatment Plant

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